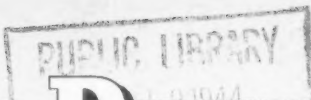


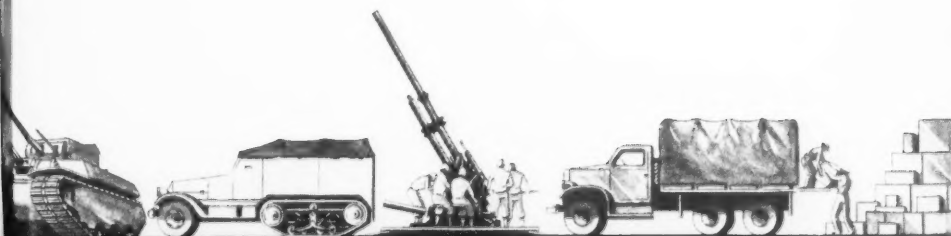
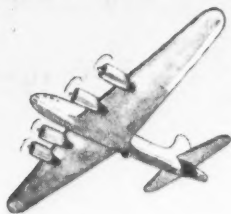
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A MONTHLY REVIEW OF MILITARY LITERATURE

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COMMAND AND GENERAL STAFF SCHOOL

MILITARY REVIEW

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CONTENTS

	<i>Page</i>
THE EMPLOYMENT OF TANKS WITH INFANTRY.....	Col. Leo B. Conner, <i>Cap</i> 3
THE PRINCIPLES OF PURSUIT.....	Lt. Col. Charles D. Carleton, <i>FA</i> 8
BOMBARDMENT PLANNING.....	Lt. Col. George W. R. Zethren, <i>AC</i> 14
PANTHER VS PANZER.....	Maj. Gilbert A. Ellmann, <i>FA</i> 21
JUNGLE TRANSPORTATION.....	Maj. J. C. Jefferds, Jr., <i>OD</i> 27
USE OF LOCAL RESOURCES.....	Lt. Col. H. R. Eichenberg, <i>QMC</i> 30
A "NEW" WEAPON—THE 4.2-INCH CHEMICAL MORTAR.....	Lt. Col. Albert E. Link, <i>CWS</i> 35
MOTOR TRANSPORTATION REQUIREMENTS FOR SHIPSIDE EVACUATION OF SICK AND WOUNDED.....	Capt. T. G. Scott, <i>TC</i> 39
"FINEST FIGHTERS, INC.".....	Lt. Col. Brainard E. Prescott, <i>Inf</i> 42
CASUALTY REPORTING.....	Col. George F. Herbert, <i>AGD</i> 48
"COMIN' 'ROUND THE MOUNT'IN"—WITH CLASS III SUPPLY.....	Lt. Col. Thomas S. Kittrell, <i>QMC</i> 52
THE ANTI-AIRCRAFT OFFICER.....	Maj. Roland W. Boughton, Jr., <i>CAC</i> 55
ARTILLERY IN BREAKTHROUGH OF A DEFENSE ZONE.....	From <i>Artilleriiskii Zhurnal</i> 61
BASE YOUR PLANS ON FUTURE WEATHER.....	Lt. Col. Donald H. Ford, <i>AC</i> 67
D A R A.....	Maj. James C. Davie, <i>QMC</i> 72
FIGHTING THE UNCOMMON COLD.....	Maintenance Division, <i>ASF</i> 75
MILITARY NOTES AROUND THE WORLD.....	79
FOREIGN MILITARY DIGESTS.....	85
<i>Modern Cavalry</i>	85
<i>The Salerno Landing</i>	86
<i>Control of Large Tank Units in Offensive Operations</i>	87
<i>The War in the Air, 1940-44</i>	89
<i>Some German Reconnaissance Methods</i>	90
<i>Leadership</i>	93
<i>Guerrilla Attacks on Populated Places</i>	96
<i>Notes on Jungle Warfare</i>	99
<i>German Army Supply, Evacuation, and Maintenance</i>	102
<i>Army Antiaircraft Artillery</i>	108
<i>Defense Tactics of Small German Infantry Groups</i>	110
<i>Staff of Tank Unit in Pursuit</i>	112
<i>British "Paper Warfare" in Tunisia</i>	114
<i>Self-Propelled Battery; Going Into Position</i>	117
<i>Structure of German Military Morale</i>	119
<i>German Engineers in Withdrawal Movements</i>	121
<i>RAF Over Burma</i>	123
<i>Planning the Operations of Armored Force Artillery</i>	125



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The Employment of Tanks with Infantry

COLONEL LEO B. CONNER, *Cavalry*
Instructor, Command and General Staff School

DURING World War I the tank had no successful enemies and required little in the way of support from the infantry. Now two great enemies, the antitank mine and the tank destroyer or antitank gun, have been developed to such an extent that it is necessary to call upon the infantry, the artillery, and the engineers to restore lost mobility to the tank.

Antitank mines are readily obtainable and easily transported. They can be laid in a short time and they will stop tanks. They will not stop infantry. Even though they are defended, infantry in sufficient strength and properly supported by artillery and engineers will be able to breach them and to clear lanes for the tanks.

Tank destroyers properly dug in, camouflaged, and sited to command the axis of advance have a definite advantage over tanks but they can be neutralized by artillery and defeated by infantry.

On the other hand, machine guns properly dug in, camouflaged, and sited to command the ground over which the infantry must advance can stop this infantry. This is especially true if barbed wire is used in conjunction with the machine guns. But tanks can overcome the machine guns and they can clear passages through the barbed wire.

It is obvious that there must be close cooperation between infantry and tanks. When mines or antitank guns impede the advance of the tanks, the infantry will clear the way. The tanks in turn will clear paths through the barbed wire, neutralize or destroy the machine guns, and assist or precede the infantry in seizing the assigned objective.

It is easy for tanks to seize an objective. It is not so easy to hold one. If tanks attempt to hold a captured objective for any length of time the enemy will certainly bring up antitank guns and they will be stopped; perhaps destroyed. They must be relieved, reorganized, and moved on to the next objective before the enemy can do this. Infantry must follow closely for this relief.

Infantry with engineers must follow closely for another reason. After passing through the main minefields and capturing the initial objective it is probable that additional minefields or other obstacles will be encountered covering subsequent objectives as the attack progresses deeper into the hostile position. Here again infantry will be required and required in a hurry.

It is apparent that infantry and tanks have the mutual mission of restoring lost mobility to the other.

When in open country where the mobility of tanks is not restricted they lead and clear a way for the infantry.

When in close or difficult country, or where minefields restrict the mobility of tanks, infantry leads and clears the way for the tanks.

Whichever leads, it must be closely supported by the other. Infantry must quickly take over captured ground. Tanks must protect the infantry from counterattack.

The closest coordination is required. This can be secured only by close association and by training together. A strange tank unit cannot be attached to an infantry division a few hours before an attack without some prospect of failure. Tanks that have not worked with infantry cannot be expected to function to the best advantage. Infantry cannot employ tanks properly and get the full benefit from their great power if they have not worked and trained with them.

There is another item that must be considered. Tanks attack at considerable speed. Foot infantry moves very slowly. It cannot give the tanks the close support that is required in a sustained advance. When tanks are compelled to wait for the infantry to come up and take over captured ground, the enemy is given time to move up his tank destroyers and the attack will be slowed down or stopped. He must not be given this time. The infantry must come up quickly.

The Russians have made considerable use of infantry riding on top of tanks. So have the Germans. This has worked and it will be

worked again. But it has its limitations. When infantry rides on the leading tanks, they must dismount as soon as they come under machine-gun fire. Those who ride on tanks in the rear waves will usually be able to continue on to the objective. Tanks have a limited deck space; one tank can carry six men; and a battalion of tanks has room only for one or two companies of infantry at best. A group of two tank battalions can carry the foot troops of an infantry battalion between them without requiring anyone to ride on the exposed tanks in the leading wave.

Another solution is to motorize one battalion of the infantry division and attach it to the armored group. This battalion will follow the leading tank battalion closely in trucks, dismounting to fight on foot whenever that becomes necessary. While the infantry is fighting on foot the tanks must take cover, provide fire support, and prepare for the next move.

The sketch represents a hostile defensive area. The forward area includes in its organization a series of bands of antitank mines. Assume that the 1st Infantry Division, as part of an interior corps, is making the main effort in the attack of the defended position. Hill No. 3 is the division objective. The 901st Armored Group consisting of two standard tank battalions and the necessary headquarters has been attached to the division. The Division Commander has reinforced the 901st Armored Group by the 1st Battalion of the 3d Infantry Regiment and a platoon of engineers, and has given it the mission of passing through the mined and defended area of the 1st Infantry Regiment's zone of action, after they have cleared it, and capturing the division objective, Hill No. 3. Hills No. 1 and No. 2 are assigned as intermediate objectives.

The 901st Tank Group, reinforced, is shown in its assembly position. The sketch is not to scale, but this position is actually several miles in rear where it is beyond artillery range and where it can be kept concealed. It is obvious that the enemy will mass his antitank defenses in front of the 1st Division zone if he knows that the main attack will be made there. Every effort must be made to

keep the tanks hidden; and they must be so located that, if discovered, their intended employment cannot be deduced.

It might be assumed that the 1st Battalion 3d Infantry, which has been attached to the armored group, would clear the mined and defended area. This is not a proper mission for that battalion. If it rides from the assembly area on top of the tanks they will be kept waiting in exposed positions during the infantry action. If it moves up on foot it will cause unnecessary delay and fatigue. Furthermore, the battalion may be reduced by casualties to such an extent that it will be unable to support the tanks later on. The 1st Infantry Regiment should attack in its zone and clear passages through the defended area. Then the tanks move up from their assembly area carrying their attached infantry, pass through the mined areas, and attack and capture Hill No. 1.

The passage through the mines must be carefully coordinated with the 1st Infantry Regiment. There must be enough lanes to enable the tanks to pass through quickly but not so many as to require unnecessary work and consequent delay. The group will probably attack in column of battalions. Each battalion can pass through the mines in a line of company columns and deploy quickly for the attack. Three lanes will be sufficient. Routes from the assembly position through the lanes must be reconnoitered and improved where necessary to carry tanks. Guides must be posted to mark the routes. Arrangements must be made for marking the forward limits of the attacking infantry and the rear tanks must be marked in some manner to let the infantry know when they have cleared.

Arrangements must also be made with the Artillery Commander, 1st Infantry Division, for adequate artillery support. The division artillery will be available for this. Furthermore, since this division is making the main effort of the corps and the armored group is spear-heading the division attack, the corps artillery should also be available. Artillery observers accompany the leading elements in tanks set aside for this purpose.

This artillery support is used to the maxi-

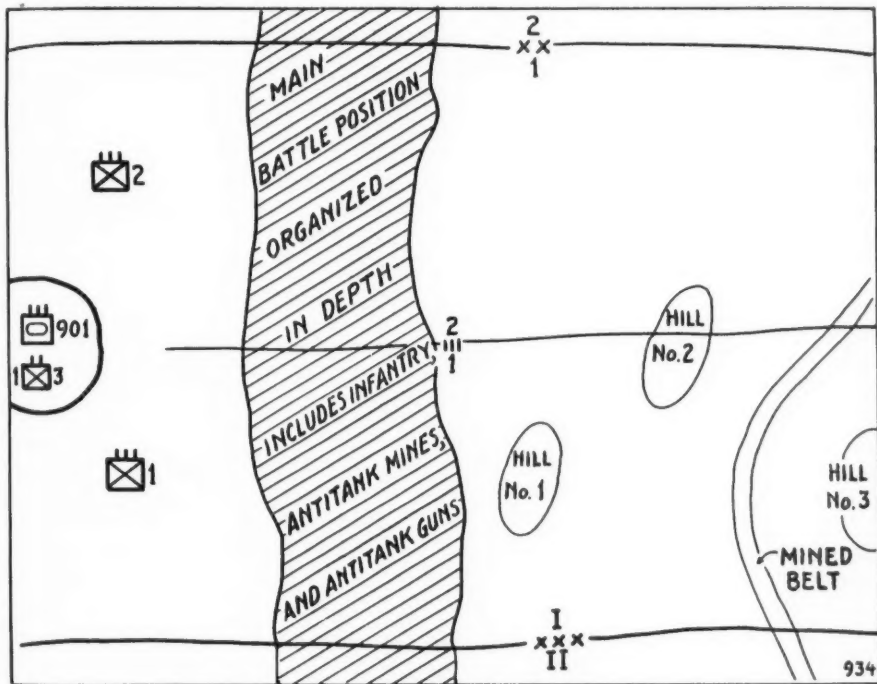
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mum. Especial attention must be paid to known or suspected locations of hostile anti-tank guns and artillery OP's; these must be neutralized by fire or blinded by smoke; and whenever tanks enter a position occupied by hostile infantry, they should be preceded and covered by an umbrella of artillery time fire employing air bursts directly over the tanks. All modern infantry is equipped with effec-

fire. Instead, they move to defiladed positions from which they can dominate the objective by bringing fire on any troops that may expose themselves or attempt to escape. They must be so placed that the objective is kept under fire, and counterattacks can be stopped. When the infantry has taken over, the tanks reorganize under their protection and prepare for the attack on the next objective. Mean-



tive antitank weapons—our bazooka is an example—but no infantry can use these weapons when artillery time fire is bursting overhead. Tanks are not affected by this fire. They stay "buttoned up." Of course, the infantry must dismount before the tanks move under the umbrella and the fire must lift before the infantry enters the objective.

Contrary to common opinion, the tanks do not "cruise" on a captured objective. If they do they certainly will draw effective antitank

while the 1st and 2d Infantry are continuing their advance as rapidly as possible.

When ready to resume the attack the tanks pick up their infantry and move forward on Hill No. 2. The attack on Hill No. 2 and the ensuing reorganization is similar to the preceding one and the attack on Hill No. 3 is started in the same manner. When the tanks discover the minefield in front of Hill No. 3 they withdraw to covered or defiladed positions while the infantry dismounts and se-

cures passages through the mined area. This infantry action is supported by fire from the tanks and, of course, by the artillery.

Throughout the attack the infantry, the tanks, and the artillery must function as a team. The tanks capture the successive objectives. Its attached infantry takes over these objectives, covers its reorganization, and accompanies it forward to assist it where conditions are unfavorable for tanks. The infantry regiments move forward in their zones to permit further forward movement on subsequent objectives. And every move of each of these elements is supported by the ever-ready massed fires of the artillery.

It should be noted in this situation that the group was not broken up and parcelled out to regiments; it was employed as a unit and directed against the main objective of the division. Right here is one of the most common errors made by infantry commanders who have been given tanks to assist them. One of our corps commanders, a well known tankerman who was an observer during the early phases of the Italian campaign, makes a comment which illustrates this point. He says that "within the infantry divisions there was considerable dispersion of attached tanks. Companies were attached to regimental combat teams and in some cases were further depleted by the attachment of platoons to battalions. The platoons were further dispersed as individual tanks were assigned secondary missions as 'mobile pillboxes.' At no time was a tank battalion sufficiently centralized to be able to attack in force or counterattack the enemy."

Tanks should attack in masses. The battalion is the normal unit of employment. When terrain is suitable for tank employment, allot all or the bulk of the tank battalions to the main effort. Often there will not be sufficient suitable terrain available for a battalion. In that case, use what you can. A company may be of great assistance. Failure to make profitable use of tanks when available is inexcusable.

The Sicilian campaign provides us with at least one instance of the profitable use of tanks. One division had worked with tanks

in Tunisia and it knew how to use them and support them. The division commander stated that "during the major portion of the Sicilian campaign, one battalion of light tanks and one company of medium tanks were attached to this division. Due to the mountainous type of terrain the tanks were nearly always canalized. However, it was found that in certain areas tanks could be used to advantage in assisting the infantry in gaining ground by lightning thrusts by tanks followed closely by the infantry assault. Tanks were always used en masse with all their supporting weapons, and whenever an attack was made the objective was taken."

Tanks need all the support they can get. They are powerful weapons. They have great firepower and a high degree of immunity from hostile fire. On the other hand they are extremely sensitive to terrain and require engineers to get them over ground that might offer little difficulty to other troops. They are comparatively blind—the members of the tank crew have very limited fields of view through their periscopes and their great fire power may be wasted due to failure to locate targets. And due to their great size they make good targets for antitank guns. In short they are not capable of independent action.

They need engineers to get them over difficult ground and through minefields; they need smoke to conceal their movements and to blind hostile artillery and antitank weapons; they need infantry to secure passages over unfavorable ground or through massed antitank defenses and to perform the necessary reconnaissance; and they need artillery support. Give them this support and you have nothing that can do as good a job in quickly crushing hostile opposition.

This mutual support and consequent high efficiency is obtained in the armored division through long and close association and training. It can be obtained when infantry divisions are operating with attached tank units if they understand their problems and have worked with them.

The infantry-artillery team is already an accomplished fact in our divisions. It has been perfected by living together and train-

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ing together. The infantry-tank-artillery team is not yet an accomplished fact in our Army. It will not become one until these three elements have lived together and have trained together. The Army Ground Forces demonstrated the initial step in the development of these teams very recently—April 1944—in a great demonstration at Fort Benning witnessed by senior representatives from all

infantry divisions and tank units in the United States. It will follow up this initial step by making tank battalions available to train with infantry divisions. As a result of this training we may expect that our infantry will begin to benefit from the great power of tanks and that the infantry-tank-artillery team will become a reality in the United States Army.

Lessons From The Italian Campaign

Digested at the Command and General Staff School from an article by Major General F. A. M. B. Jenkins in *The Journal of the United Service Institution of India* January 1944

THE nature of the country and the ease with which roads are put out of action forces our troops off the roads into the mountains. The lack of animal transport, dispersal areas for artillery and motor transport, and lack of pack artillery means that troops must, when operating in the mountainous parts, be prepared to rely on their own weapons for supporting fire, and these must be carried, plus food and ammunition.

Careful organization and training are necessary; special equipment must be issued; and all must be prepared to improvise and use any type of animal transport from a donkey to a camel.

The rivers and *wadis* quickly flood. It is essential, therefore, that sufficient ammunition and food for at least forty-eight hours, for any force, however small, operating forward of any watercourse liable to spate, be dumped early. Unless this is done, a force may find itself cut off far from its vital supplies at a time when it most needs them.

Never consider any ground too difficult for tanks. Nor should infantry or antitank gunners consider any obstacles too difficult to get antitank guns across. I have seen guns dragged over the most impossible ground, only achieved by sound training and determination. Every infantryman should be issued a short length of rope, light but strong. Each rope should have a loop at one end and toggle at the other. These can, when

necessary, be joined together and used as tow ropes or for any other purposes for which they may be required.

In the coastal areas, heavy weapons can be moved by sea in order to bypass a demolition which may take some time to repair.

Forward troops must report early any road blocks or demolitions, and Divisional Provost must anticipate these by study of air photos and maps. Traffic control posts can then be ready well up in the column to be posted some way back from the obstacle, and so prevent motor transport congestion around it. The jam of transport in the area of the blown bridge across the river Biferno was indescribable; and the enemy made full use of the target. Officers appointed to Provost units must be specially selected and none but the best accepted.

All troops must be trained in mine-lifting and detecting. Training in this must be realistic, and must include handling and lifting live mines. "Training minefields" are essential, and these should contain every type of booby trap, so that men will know what to look for when they come up against them.

However tired, troops must dig in. I am sure that at the battle of Termoli, had the troops got down to serious digging a part of our line would not have been driven in. I hardly saw a single trench in the whole area, and yet the ground was mainly plough, and very suitable for digging.

The Principles of Pursuit

LIEUTENANT COLONEL CHARLES D. CARLETON, *Field Artillery*

Instructor, Command and General Staff School

THE purpose of offensive action is the destruction of the armed forces of the enemy.

The term "destruction," when applied to an armed force, does not necessarily mean the extermination of all personnel. In the military sense, an armed force is destroyed when it is broken up into unrelated and disorganized parts so that it is incapable of coordinated action.

To accomplish this destruction, initial success in combat must be exploited.

Since a defeated enemy can withdraw and retreat, except in cases where he is surrounded or is trapped by terrain, it is practically impossible to destroy his force in position. It will, therefore, in most cases, be necessary to pursue him to exploit initial success and make victory complete.

The commander must have the will to accomplish the final destruction of the enemy force, and must have a sound knowledge of the principles of pursuit as a means to this end.

The Field Service Regulations state that pursuit is launched when the enemy is no longer able to maintain his position and endeavors to escape by retreat. The decision to launch a pursuit, by this definition, is based on evidence of decisive defeat of the hostile force.

The pursuit decision is difficult. It is easy to describe here the factors influencing the decision; but under battle conditions, with confused and conflicting information, the indications will not be clear and definite. Each fact that has bearing on the decision must be considered and fitted into its proper place in the picture. Further, the enemy will do everything possible to hide his weakness and conceal his movement, since daylight withdrawal under attack is difficult and costly.

There can be many indications of success which may be summed up to indicate decisive defeat of the enemy. Among these are the numbers of hostile dead and captured,

quantities of captured equipment, reduction of hostile artillery fire, slackening of hostile countermeasures, and hostile disorganization. Other signs are low morale of enemy prisoners; movement of enemy trains to the rear; and individual men of forward elements moving straight to the rear, across country. When these indications are confirmed by the continued advance of friendly troops in a decisive direction or by the capture of critical objectives, it is time for the decision.

Pursuit must be launched promptly and vigorously. It must be launched day or night without permitting the enemy to break contact or to reconstitute his defense. Prompt advantage must be taken of the fact that the enemy knows that he has been decisively beaten and is trying to escape destruction. Much pursuit will be made at night because of the natural effort of the enemy to conceal his withdrawal by moving after dark.

Pursuit is not an easy matter, because the troops are usually physically exhausted and disorganized, units are scattered and mixed, and there is a mental reaction of let-down which tends to affect all who have taken part in the action. Under these circumstances, the launching of a vigorous and prompt pursuit will usually depend upon the energy and will-power of the commander. If he does not have enough energy and aggressive will-power to force the launching of the pursuit, the result will be unsuccessful—or more likely yet, no pursuit at all. Weak soldiers do not launch effective pursuits.

Let us take a moment to consider an example of forceful action on the part of a division commander. This occurred in November 1918, in the Argonne, when the U. S. 2d Division was taking part in an attack by a corps.

The attack had been launched on the 1st of November and continued into the next day. The 2d Division began early to discover evidence of decisive defeat. In the first place, their attack had caught one German di-

vision in the process of relieving another in the line. In addition to this, resistance was petering out rapidly, and there was very slight hostile field artillery activity. Most significant of all, even when the 2d Division had pushed a dangerously exposed nine-kilometer wedge into the German lines, there were no counterattacks.

The decision to pursue was made on the night of 2-3 November; and the division commander made this decision in spite of the fact that his troops were weary from two days of attack, and were ravaged by fever, influenza, and dysentery. In addition to this, there had been constant rain and the troops had had practically no food.

Counterbalancing these difficulties was the fact that he was dealing with a defeated enemy, and the fact that his own troops were still possessed of high morale and the determination to win.

This aggressive decision paid dividends; for by midnight 3-4 November, the 2d Division had advanced twenty kilometers into the German lines.

The object of pursuit is the destruction of the enemy. This will be accomplished most effectively by the combination of direct pressure and encircling maneuver. Forces of great mobility must be constituted quickly, to pass around one flank or both flanks of the enemy in order to place troops across the hostile axis of retreat. The enemy must be slowed down or stopped so that he can be crushed between the hammer of the direct pressure force and the anvil of the encircling force.

The lack of maneuver space to the flanks or the absence of units of sufficient mobility to overtake the enemy must not prevent pursuit. If these conditions apply, pursuit must be carried out by direct pressure alone, by aggressive and continued attack. This method will frequently fall short of the mission of destruction of the hostile force, because that force cannot be overtaken or held for the final blow. The pursuit by the 2d Division, mentioned above, was limited to direct pressure because of the location of the

division in an interior sector of the corps front.

The wise commander, planning an offensive operation, includes in his scheme tentative plans for pursuit. He will consider the following factors:

The encircling force must be highly mobile and its constitution will depend on the troops available to the commander. In a large force, armored or airborne divisions are specially appropriate to pursuit missions. The armored division is organized primarily to perform missions that require great mobility and firepower, and it is a normal mission for the airborne division to delay the retreating enemy until the main forces can overtake and destroy him. When armored or airborne elements are not available, the commander may have to withdraw units from battle or employ his formed reserves. In any case, the units forming the encircling force should be motorized, when practicable, to increase their mobility.

The assembly area for the encircling force should be beyond the range of effective artillery fire, and on a favorable road net; it should have adequate cover and concealment, and should be suitable for the size and composition of the command. It should be located conveniently with reference to the route of encirclement, and located conveniently for the foot troops.

The objective picked out for the encircling force must be appropriate for the accomplishment of the mission, which is to overtake the enemy and hold him for destruction between the two forces. Suitable objectives are mountain passes, bridges, road centers through which the enemy must pass—or terrain features overlooking the line of retreat.

The route should be specified as far as the flank of the hostile force; thereafter the route must depend upon the commander of the encircling force who will be better able to judge the progress of the enemy retreat. This route should be beyond the range of hostile artillery fire, and should be parallel to the hostile line of retreat.

The encircling force, when it moves out, heads for its objective. If it is outdistanced

by the retreating enemy, it seeks to cut in and seize some critical locality, or to attack the retreating main columns in the flank. If it finds that the retreat has slowed down, the encircling force may cut in and seize closer critical objectives—using the original ones in a final phase of action.

The direct pressure force consists of the entire force less the encircling force. Just before the pursuit begins, the units will be scattered and some will be moving in a direction different from that desired, so that some reorganization will be necessary before taking up direct pressure.

In order to effect this reorganization, the commander designates a reorganization line far enough within the hostile position so

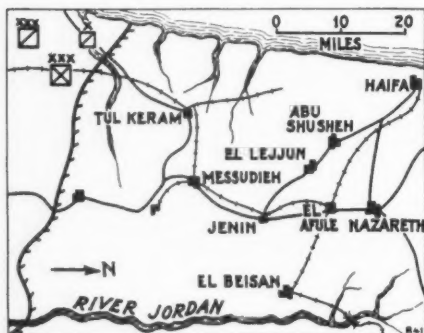


FIGURE 1.

that, when his units stop to reorganize, any intervening covering forces will have been overrun. Under no circumstances must the enemy be allowed to break contact by halts for reorganization. Reserves should be committed to maintain contact while scattered units halt to reorganize. At night, units not seriously opposed continue their march, while others organize successive limited attacks to the front.

Normally, the direct pressure action should be conducted by combat teams under mission type orders. Appropriate attachments should be made and objectives assigned. Centralized control by the division commander is extremely difficult in the rapid and diversified operations of pursuit.

For control, telephone wire lines will be pushed forward rapidly along the main axes of advance, and advance message centers and command posts will be established close behind the leading troops. Major dependence, however, will be placed on radio, because of the expected rapidity of the action. Under the conditions of pursuit, restrictions on transmissions in clear can be relaxed as danger from intercepted messages is considerably reduced.

General Allenby's pursuit of the Turks in his campaign in Palestine in 1918 is classic in the perfection of its adherence to the principles in the Field Service Regulations. In this operation, the encircling force was the British Desert Mounted Corps.

On 18 September 1918, the British advance to the north had stopped and British and Turkish forces were stabilized, generally, along the line shown in Figure 1.

General Allenby's force was opposed by the Seventh and Eighth Turkish Armies. On the critical west flank Allenby had the XXI Corps with its left flank covered by the 5th Australian Light Horse Brigade. To the left rear of these units, near the coast, he assembled secretly the Desert Mounted Corps.

The steps taken to maintain secrecy were remarkable, and included the setting up of new camps in the Jordan Valley and the construction of 15,000 dummy horses there. In addition, agents were sent out to bargain for large quantities of forage for delivery in the Jordan Valley area.

The Turkish lines of communication were the Hedjaz railroad branch, and a road net that was roughly parallel to it (Figure 1). The railroad entered the area over the Jordan River bridge near El Beisan just south of the Sea of Galilee. At the town of El Afule, it branched west to Haifa on the coast and south to Messudieh Junction, and from there one branch went west to the town of Tul Keram. The Turkish General Headquarters under General Liman von Sanders was located at Nazareth.

The country was rugged and arid. The Jordan was a flanking obstacle to the east, and its precipitous valley was available as a

route of communication in emergency. A high ridge ran from Messudieh to Haifa with two passes suitable for cavalry operation: one on the north at Abu Shusheh, and the other south of the first at El Lejjun. These passes were easily defensible by an organized enemy.

Allenby's offensive plan included plans for pursuit (*FSR: In anticipation of the time for launching the pursuit the commander causes preparatory measures to be taken*). The points of immediate interest follow.

The attack of the XXI Corps was to swing the Turkish west flank back on Messudieh. The Desert Mounted Corps was to go through the gateway thus opened, along the coast, disregarding any enemy that did not oppose their progress, and then cut in eastward to their objectives through the passes at Abu Shusheh and El Lejjun (*FSR: Preparations are made for launching one or more forces of great mobility in encircling maneuvers*).

Definite objectives were assigned to the Desert Mounted Corps (*FSR: Distant objectives are assigned to the principal tactical groupings*) and fit exactly the description of good objectives given earlier in this discussion. These were:

1. Nazareth, Turkish GHQ.
2. El Afule, a road and railroad center through which the retreating enemy would have to pass.
3. El Beisan—on terrain commanding the Jordan Valley, a possible Turkish escape route.
4. The railroad bridge over the Jordan—a possible escape route for rear elements.

The attack jumped off at 0430, 19 September. There was early evidence of success. This was exploited, not by the Mounted Corps, but by an element of the direct pressure force: the 5th Australian Light Horse Brigade (*FSR: When a commander recognizes that the enemy is having difficulty in maintaining his position, he utilizes all means to . . . exert a relentless pressure on the defeated enemy*). However, the evidence was sufficiently good to set the Mounted Corps in motion. By noon the Turks were in wild dis-

order and the 5th Brigade had invested Tul Keram and had cut the railroad line north of Messudieh (Figure 2).

The Desert Mounted Corps proceeded north

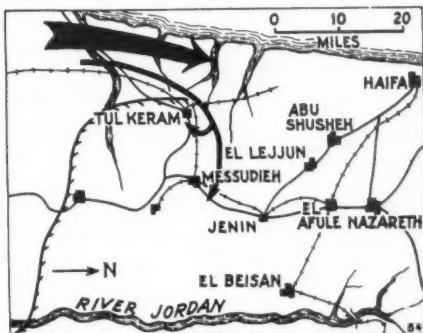


FIGURE 2.

by forced march during the night. The 5th Cavalry Division went through the northern pass at Abu Shusheh and by 0530, 20 September, one of its brigades had taken the Turkish General Headquarters at Nazareth. The other brigade made El Afule by 0800.

The 4th Cavalry Division had to fight its way through the pass at El Lejjun, as they arrived there just in time to prevent the Turks from setting up an effective defense in the pass. In spite of this opposition, they

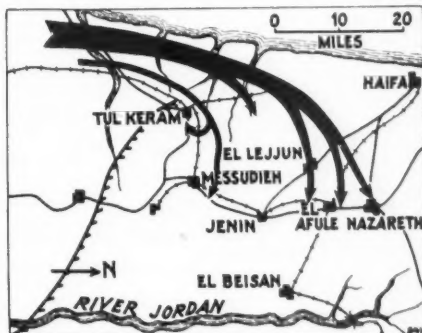


FIGURE 3.

were passing El Afule by 0800. The Australian Cavalry Division followed the 4th through the pass at El Lejjun at about 1100 (Figure 3).

The 4th Cavalry Division was in El Beisan by 1630 and the 19th Lancer Regiment split off and went on eastward to take the rail-

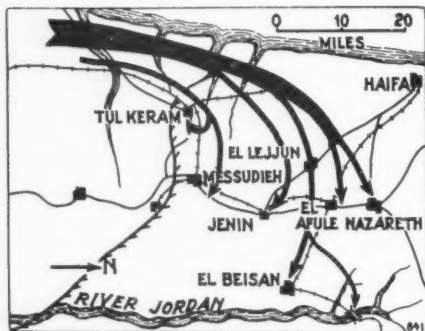


FIGURE 4.

road bridge over the Jordan. This bridge was in the hands of the Lancers by nightfall.

The Australian Division made an additional cut of the railroad at Jenin, completing this operation late in the afternoon (Figure 4).

All routes of escape were now closed to the Turks, and their entire force was crushed between the hammer of the direct pressure force and the anvil of the Desert Mounted Corps. The result of this splendidly planned operation was the capture of practically the entire Seventh and Eighth Turkish Armies.

A modern application of the principles of



FIGURE 5.

pursuit, employing armor, took place in North Africa in February 1941 when the British forces under General Sir Archibald

Wavell destroyed the Italian Libyan Army south of Benghazi (Figure 5).

After the Italians were defeated in Tobruk on 2 January, they took up a new position just west of Derna, sending an armored brigade to the road junction at El Mekili in order to cover their right flank (Figure 5). They were able to hold at Derna until 30 January. After that the British moved forward at the rate of thirty miles per day until they entered Cyrene on 3 February without opposition. It was then apparent that the Italians had given up the idea of a defense and were already in full retreat. By that same day, 3 February, units of the British 7th Armored Division forced the Italian armored brigade to retreat from El Mekili and the stage was set for real pursuit.

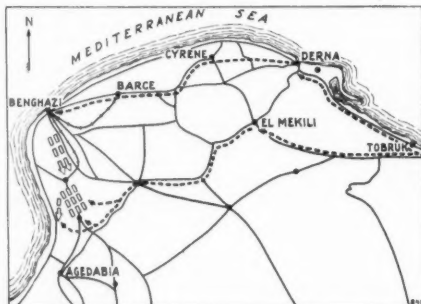


FIGURE 6.

In this case, however, there was no opportunity for careful prior planning and the pursuit had to be launched at once in spite of fatigue and other unfavorable conditions.

The direct pressure force consisted of Australian troops in motors, ably supported by combat aviation which bombed and machine-gunned the Italians along the northern route (FSR: *Supporting combat aviation concentrates on . . . hostile columns in retreat*).

The Italians initially made for Barce, a town at the end of the railroad spur running north from Benghazi (Figure 6). The idea was to make good their retreat by rail, but the Australians were too close behind them. Before more than a few could get away,

they were hurried out of Barce and on south to Benghazi where they were joined by the garrison of Benghazi all packed up and ready to go. Together they continued the retreat to the south.

In the meantime, the British 7th Armored Division at El Mekili turned to the southwest and, moving in two columns, pushed across the open desert in order to intercept retreat on the coast south of Benghazi (*FSR: The purpose of the encircling maneuver is to get in rear of the defeated enemy and halt his retreat so that he may be destroyed between the direct pressure and encircling forces*). This unit had tough going. The road shown in Figure 6 did not exist. The armor, moving across the open desert, was forced to travel by compass and stars; and handicapped by sandstorms, it was slowed down to a crawl. It took thirty-six hours for that armored division to cover the 150 miles between El Mekili and the coast.

They arrived just in time, for one hour and forty minutes after they reached the Benghazi road the Italian column appeared over the horizon. Two hours more and the Italians would have been able to escape the trap. They fought hard to break out all the afternoon of the 5th, all day of the 6th, and during part of the morning of the 7th; but the British, initially outnumbered five to one, were able to hold until the arrival of units of the direct pressure force.

At 0900, 7 February, the Italians surrendered—giving up 216 guns, 112 tanks, 1,500 trucks, and 20,000 prisoners. Their armed force was destroyed (*FSR: By the coordinated employment of every available agency of destruction . . . the shaken morale of the defeated enemy is converted into panic*).

It is apparent that this operation might have been dangerous, for neither British force was within supporting distance of the other; and further, the encircling force was heavily outnumbered for a considerable period of time. General Wavell had estimated accurately the winning factor, enemy morale bordering on panic, and the operation was a complete success.

To sum up, the major points to be remembered in connection with pursuit are:

Pursuit is usually necessary to turn initial success into victory.

The commander must have the will and energy to launch pursuit in spite of all obstacles, and press it to the limit of endurance of his force.

It must *not* be launched before the enemy gives evidence of his inability to hold his position. G-2 must push all agencies to obtain those elements of information that indicate retreat so that pursuit can be launched as early as possible.

It must be so conducted that it will crush and destroy the enemy between the direct pressure and the encircling forces.

The encircling forces must have great mobility and fire power. Both armored and airborne units are specially adapted to encirclement since both characteristics are inherent in armored units and because of the extremely high mobility of airborne units.

The direct pressure force must have weight and driving power. Massed artillery fire gives weight to the direct pressure, and armored units, if they can be spared from the encircling force, will vastly reinforce the drive of the other arms.

Combat aviation should work closely with the pursuing forces whenever available.

You have enemies other than Nazis and Japs—such as cut and bruised tires, rust, dry bearings, run-down batteries, and frayed electrical wiring among others. Preventive maintenance will easily beat these enemies, leaving the beating of Nazis and Japs up to you.

—Maintenance Division, ASF

Bombardment Planning

LIEUTENANT COLONEL GEORGE W. R. ZETHREN, *Air Corps*
Instructor, Command and General Staff School

OUR basic concept of air power places the greatest consideration on the principle of the "Offensive." In nearly every theater in which we are in action our air forces have assumed the offensive. Where strategic considerations have forced us to fight a strategically defensive war our air forces are accomplishing their mission through carefully coordinated offensive action.

Extremely important in offensive operations is the principle of the "Objective." This involves establishing a definite goal in our air operations, an objective towards which we must continually point all our efforts and which we must constantly keep in view—otherwise the enemy will not receive the full impact of our effort.

Both of these principles, that of the "Offensive" and the "Objective," are fundamental and form the background for bombardment planning.

Planning a bombardment mission is no simple task. It involves more than merely telephoning a subordinate element and directing: "Let's bust the Japs tonight with a few tons of bombs on Tokyo." Full consideration must be given to such factors as an analysis of the target, its proximity to our air bases, the ability and determination of the enemy to defend it, the equipment and means available to us with which to strike the target, and whether or not the results that can be achieved are commensurate with the losses we expect to sustain on the mission. To emphasize the importance of detailed planning for each mission we undertake, let us look at some of the factors which will influence the success of a bombardment mission and which we must consider in order that we may employ our force with maximum economy and effectiveness.

First, let us assume that we are members of the staff of the American Eighth Air Force in England. The mission of this Strategic Air Force (SAF) is to destroy the enemy's vital industries and communication facilities

which will result in the reduction of his capacity to wage warfare. The cumulative effect of our attacks should deny weapons and supplies to the enemy's armies and so weaken them that they will be incapable of effective resistance to our ground armies, which will eventually push forward into the hostile territory and take possession of the enemy's resources. When this is possible the enemy has been totally defeated and we have accomplished our war aim.

In effecting this measure of destruction of the enemy's capacity for war, we must establish a system of objectives, destroying first those objectives which will make the maximum contribution to the enemy's downfall. What types of objectives will be our targets? Will we bomb indiscriminately all enemy air-dromes, aircraft factories, engine factories, armament works, and all of the fuel and other supply dumps found in enemy territory? No, we certainly will not—if we were to attempt this the results of our efforts would be to affect only temporarily the enemy's loss in production from one or more of these sources, and we would not realize the cumulative effect of systematic bombing.

What we must try to do is to determine the important cog in all this industrial machinery. To illustrate this, you can see that the destruction of enemy oil storage tanks will be a temporary loss only; whereas if we were to destroy the refinery which produces this fuel, the loss to the enemy would be more permanent. To go a little further—the enemy may have thirty oil refineries, each contributing a portion of the fuel used. Through intelligence sources we might learn that four of these refineries produce half of the total amount of fuel, while the other twenty-six contribute various small amounts which make up the remaining fifty percent of the total. Thus you can see that the destruction of these four major refineries first would have a greater effect than if we selected our targets in a haphazard manner. Although the

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destruction of these four refineries would not stop all operations, cumulatively, the systematic destruction of all the refineries in the order of their importance will, if destruction is maintained, eventually stop all enemy operations which depend upon fuel.

The same principle applies in other situations. If we determine that the carburetor is a vital accessory in aircraft engines and tank engines, and that only seven factories in Europe manufacture carburetors, you can readily see that the destruction of these seven factories will contribute much to the weakening of the enemy forces.

These important cogs in Germany's industrial system will be indicated to us in reports from such agencies as the Office of Strategic Services. The entire economic system of Germany and her satellites will have been surveyed by a board of economic and industrial experts to determine these soft spots in Germany's armor. With this information available to us, we, as members of the Air Force Staff, must systematically plan the destruction of the vital objectives and through the cumulative effect of constant bombings render these objectives useless to the enemy in his war effort.

In intensive operations such as those from Great Britain, the highest headquarters will undoubtedly select a system of objectives. These may be transmitted to the SAF Commander in the form of a directive which prescribes the period of time in which each phase of operations will be completed if the cumulative effect of the bombing is to be achieved. Here is where the Air Staff must use some ingenuity in planning. The SAF will be limited in the amount of replacements it receives and it must, therefore, plan its missions with great care if it is to keep its losses within a reasonable figure and commensurate with the results obtained on its missions. Each mission must be successful—failure to destroy the objective or excessive losses on any raid will tend to retard the bombing program and prolong the air war.

Weather is a factor which will exercise great influence over our planning. We must have suitable weather at our bases if we are

to take off from them and return again from a mission. Although precision bombing accomplishes the best results, we have perfected instruments which enable us to bomb targets effectively through an overcast sky. However, if the weather in any area extends to such a high altitude that we cannot assemble our airplanes and fly in formation above the overcast, we must abandon our missions in that area. Having selected an enemy area in which the weather will permit operations, we must determine the priority of the targets that are included in it, and then examine each target in order of priority to determine whether or not we have available a force that is capable of carrying out a successful attack against the target. Perhaps our forces will have been so depleted from previous operations that we must select a target slightly down on the list of priorities in order to attack one that we can successfully knock out.

The tactical situation will also influence us in the selection of a target. We must continually check on the disposition of enemy defenses in each area, and the capabilities which the enemy has for shifting these defenses. We know that the enemy fighter defense system is extremely flexible and we must, therefore, plan our operations with the view of deceiving the enemy as to our intentions.

We will often plan diversionary raids just prior to the main effort in order to scramble the enemy's fighters and draw them off to other areas, thereby preventing him from opposing our advance with a strong reinforced fighter force. In this respect we must be careful not to make our action stereotyped; we must be flexible in our planning and continually employ different tactics if we are to prevent the enemy from anticipating our moves.

Through continual reconnaissance by our own forces and through information we receive from other intelligence agencies, we will have a constant check on the location of enemy aircraft warning stations and anti-aircraft artillery (AAA) installations.

We must, if possible, route our bomber for-

mations in such a manner that we will prevent the enemy from quickly picking up our approach with his aircraft warning stations. If he detects our approach early on the advance to the target, he will have time to verify the size and nature of the formation we are employing and he will have time to shift his fighters laterally to intercept these formations. The enemy is cagey—he has learned enough about our operations not to send his fighters up after our diversionary fighter sweeps and he now holds them back to employ them against our major bomber formations which are striking his vital industries.

In the European Theater, Axis AAA is a definite threat to our bomber formations, even when they fly above 20,000 feet. Although casualties from flak may not be great, flak damaged aircraft often straggle from formations and become easy prey for enemy fighters. We must route our formations to avoid insofar as possible the dense belts of AAA which the Germans have established throughout their industrial areas. Enemy AAA defenses also extend generally along the whole Channel coast, and to minimize the effects of this AAA we must insure that our bombers have gained their altitude before crossing the enemy coast. On returning to England again, damaged bombers which cannot maintain altitude must cross this coastal area at a point where enemy AAA is least dense. We must also make an accurate analysis of the flak in the area of the target to enable us to approach the target over the route that will subject our planes to the least number of possible flak bursts, and enable us to approach at an altitude above the flak if it is possible at that altitude to bomb the target with the required degree of accuracy.

Our reconnaissance will also reveal to us the existence of enemy camouflage and of dummy installations. We must plan our missions in such detail that we insure that our forces will not drop their bomb load on some non-existent target. This requires proper training of the crews and careful briefing on the objective prior to each mission.

After we have chosen an objective to at-

tack, we must select the weapons with which to accomplish our mission. Based upon the nature of the enemy defenses and target, and the distance of the target from our bases, we will make a decision as to the type of plane we will employ in the operation.

Next we must determine the vulnerability of the target to our attack, the type bomb we will employ against it, and the number of bombs which must strike the target to destroy it.

For strategic industrial targets in Germany, this information will already have been furnished us by our board of analytical experts. They would undoubtedly have made a thorough study of the target, determining whether or not we would employ 1,000- or 500-pound general-purpose bombs, thermite or oil incendiary bombs, or a combination of both; they would indicate whether an instantaneous fuze or a delayed-action fuze would wreak the greatest permanent destruction on the objective. These analytical experts would also determine the probable area of destruction of an individual bomb against the target and, therefore, the total number of hits that would be required. From this information, and knowing the probable error of bombing for our formation of bombers, we can determine the approximate number of bombs that must be dropped to obtain the desired number of hits and the destruction of the target in any operation. From a careful study of the pattern of the objective, these experts would also tell us the aiming points for various elements of our formation so that our bomb pattern will effectively cover the objective.

There will be times when we are engaged in operations wherein we do not have the assistance of these analytical experts who will give us complete information on the target. Our own staff will then have to make a complete study of certain targets. We know, however, that with experience, we have built up tables which will show us the proper type of bomb and fuze with which to secure the best results against various types of target construction. As an example, let's consider structures in Italy. Our study has revealed

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that in many areas in Italy much of the building construction is of stone or similar materials. In preparing plans to bomb these objectives, what type of bomb would you employ—armor-piercing, general-purpose demolition, fragmentation, or incendiary? It is quite obvious that we would employ the general-purpose demolition bomb. Because the structure is of concrete, mud composition, or stone, incendiaries would have no effect against it. Fragmentation bombs and armor-piercing bombs would also have little effect upon these structures, but the blast effect of the demolition bomb should cause a considerable degree of destruction.

Now, which type of fuze should we use against this same type of construction, delayed-action or instantaneous? An instantaneous fuze would probably cause only superficial damage, whereas the delayed-action-fuzed bomb would penetrate to the inside of the structure and perhaps cause the collapse of the whole of the interior of the building. By studying targets in this manner we can arrive at a reasonably good selection of bombs and fuzes required for their destruction.

Let's consider the probable error in our bombing operations again from the viewpoint of the altitude from which we are going to drop the bombs. We know that the probable error increases with altitude, as indicated in this chart.

BOMBING ACCURACY REQUIREMENTS

Altitude Over Target Feet	Number Aircraft Required
5,000 -----	3
10,000 -----	5
15,000 -----	7
20,000 -----	10
25,000 -----	15

To obtain the required number of hits to destroy the target requires three aircraft if the bombing is done from 5,000 feet, and seven if it is done from 15,000 feet, and fifteen aircraft if we bomb from 25,000 feet. You can see from these figures that we will bomb from the lowest possible altitude permitted by the enemy anti-aircraft defenses.

In addition to the probable bombing error,

we must attempt to determine how many planes we must dispatch against the target. This involves a consideration of the probable number of bombers that will return to base without dropping their bombs on the target because of development of adverse weather, mechanical failure, or other such causes. We must include also an estimate of the number of planes which will be lost to enemy action before reaching the target. After a study of all of these factors we can finally arrive at the number of planes we must order out on a mission against specific objectives in enemy territory.

All of these planning considerations require that we have a thorough knowledge of the basic characteristics of the weapons that are at our disposal if we are to employ them properly and effectively. We must know the fundamental tactics of various air operations and we must know the purpose for which our weapons have been specifically designed. Too many commanders and operations officers do not appreciate the fact that the planes they are using have been designed to give maximum performance for a definite type of operation. We have heard of B-17's, designed for high-altitude flying, employed on minimum-altitude attacks wherein they sustained excessive losses. We have also heard of raids in which night interceptor fighters, equipped with special radio devices, were sent on daylight attack missions over the enemy lines. In one instance, not one of a unit of twelve of these planes returned to their bases. They were shot down behind the enemy lines, and the secret radio equipment which these planes carried fell into the hands of the enemy.

In outlining the tactics to be used for various operations we must continually keep referring to the enemy's capabilities. As soon as the enemy has found a method by which he can successfully inflict heavy casualties on our formations we must revise our tactics, and as soon as he develops new weapons with which to strike us, we must modify our weapons or develop new weapons ourselves with which to meet his threat.

You can perhaps recall newspaper accounts of our early action against Germany with

the Flying Fortress, our high-altitude, long-range, heavy bomber. In many of these early missions we relied solely on the defensive fire-power of the Fortress for protection against enemy fighter attacks. Initially these operations were extremely successful, but soon the enemy developed fighter tactics enabling him to attack our bomber formations effectively and to inflict excessive casualties on them. We then sent out our own fighters to accompany and protect the bomber formations while over enemy territory and successfully counteracted the German fighter threat. However, as our bombers penetrated deeper into Germany to strike at industries the enemy sought to move out of attacking range, our fighters could not escort the bombers the whole distance into the target because of limitations on their range caused by insufficient fuel capacity. Realizing this, the enemy then began massing the greater portion of his fighter strength to strike at our formations after the fighters were forced to withdraw and return home.

The enemy also began at this time to employ the aerial rocket which he lobbed into our bomber formations in an attempt to break them up. Although the rocket in itself did not directly cause great casualties among our bombers, it did inflict enough damage on them to force a few of the bombers out of the defensive formation in which they were flying. Then his fighters would renew their attacks upon these crippled bombers that were limping back home alone, with the result that our bomber casualties on missions deep within Germany again became excessive.

Our forces anticipated action along the above lines and had developed, through modification of existing fighters, the long-range fighter escort planes that we have today. With their increased range these fighters were soon capable of accompanying our bomber forces to such distant enemy targets as those located in East Prussia and our forces had again reduced the effectiveness of the enemy's fighter attacks. This action illustrates another important phase of bombardment planning, the necessity of con-

stantly keeping ahead of the enemy in the tactical employment of our weapons.

Although most of the factors we have discussed so far are applicable to all phases of bombardment planning, we have referred to them in the light of operations of a Strategic Air Force. Now let's consider our Tactical Air Forces.

Our Tactical Air Forces (TAF) are designed to collaborate with our ground forces in gaining a decision over the enemy air and ground forces on the battlefield. With the enemy aircraft threatening and pressing home determined attacks against our ground forces, installations, and lines of communication, our advance will be seriously impeded and the mobility of our forces will be restricted. In order to give our forces greater freedom of action, the primary objective of our TAF will be the destruction or neutralization of the enemy air force.

An important phase of TAF operations will be the continual bombardment of enemy lines of communication in an attempt to interdict the flow of supplies and reinforcements to his forces engaged in action on the battlefield. If successful, these attacks will place great limitations on the enemy's effort and give a distinct advantage to our own forces. Another phase of TAF employment consists of attacks against enemy forces and defenses on the battlefield. These include attacks against personnel, weapons, and vehicles in contact with our forces, the destruction of roads and bridges in the enemy's line of advance, the denial of ground to the enemy by the use of chemicals, the screening of our own action by the use of smoke, and the attack of reinforcements concentrating to counterattack our ground forces.

The bombardment planning factors we have already mentioned from the viewpoint of SAF operations apply equally well to bombardment missions of our TAF, especially operations to cut the enemy's lines of communication and against his air force. However, for illustration, let's consider briefly the tactical considerations involved in bombardment attacks against ground targets on the battlefield.

The type of attack we will employ against the ground targets will vary greatly with the nature of the hostile defense. In the Southwest Pacific Theater we might find that we can achieve great surprise against the Japanese and successfully attack them by using minimum altitude attacks. In the European and Mediterranean Theaters we might discover that the enemy employs such effective defense measures that this method of attack can be used only when we achieve overwhelming surprise and catch the enemy forces napping.

This was the case in the Mediterranean area where the Germans employed 20-mm and 37-mm automatic anti-aircraft weapons in such concentrations that our light and medium bombers had to attack at altitudes above the range of this AAA.

Let's assume a situation in which we are attacking hostile armored forces when they are dispersed with their supporting vehicles in the same area. We know that these supporting vehicles have 20-mm automatic weapons which are extremely effective against aircraft up to altitudes of 4,500 feet. The Germans will also have, in lesser numbers, 37-mm and 40-mm guns which have an effective range of 7,000 to 7,500 feet. In addition to this there are a number of 88-mm antitank guns and AAA in the vicinity. They will fire with fair results as high as 25,000 feet and are very effective at about 18,000 feet. However, because of the speed with which low-flying aircraft pass over the target, the difficulty of rapid traverse of the 88-mm gun makes it relatively ineffective below 8,000 feet when firing directly over the target. How, then, will we attack the tanks of this armored force?

Here's a possible solution. Assuming that we are using a fighter-bomber, we could approach the target at an altitude of 12,000 to 15,000 feet. When nearing the target the 88-mm guns would fire at us at their most effective range. To avoid this 88-mm fire we could glide gently downward in order that we arrive over the target at about 8,000 feet altitude. The fact that we are losing altitude and employing evasive action makes us a

very difficult target for the 88-mm gun directors to track and their fire will not be accurate. When over the target at 8,000 feet, we know that we are above the effective range of the 40-mm Bofors, but we determine to dive down to approximately 4,500 feet in releasing our bombs to attain more accuracy and better results. We are subjected to the 40-mm fire for a few moments, but we have avoided the fire of the 20-mm guns which, because of the great numbers of them possessed by the Germans, fire so dense a barrage that we would sustain great losses in destroyed and damaged aircraft. By releasing our bombs above 4,500 feet, we are able to place a very effective pattern of bursts over the target area.

As stated above, this method of attack may not be as effective as the minimum-altitude attacks we can employ against Japanese forces, but we must consider the tactical situation and plan our missions so that the losses we sustain will stay within the brackets we have set and will be commensurate with the results we achieve. There may be a situation, however, where the target is such a vital one that we will chance the increased casualties of a minimum-altitude attack even against formidable enemy anti-aircraft defenses.

In all TAF operations, missions planned in advance and in detail will usually meet with more chance of success. However, when we strike at forces which are in immediate contact with our ground units on the battlefield, and which are targets of opportunity, advance planning is not always possible and our bombers will be sent out on missions "on call" from the ground units. You can see the difficulty we will encounter there. We must have efficient means of communication with the ground units in order that we may find the target, and we must have simple, effective methods of designating our own front lines and the enemy target. This problem of communication has always been a difficult one. At the present time we seem to have obtained some success with ground units employing visual signals to indicate the desired information to the air. Coming more and more into use is

the system of using oblique photographs with overprinted grid lines. With these photos in the hands of both ground and air force units, targets can be quickly located and the problem of target designation is somewhat simplified. However, the problem of ground-air communication has still not been completely solved and it remains one of the major planning problems we are confronted with when making air attacks in the immediate vicinity of our front-line troops.

In summary, remember these points on bombardment planning. To operate with continued success we must have a thorough knowledge of the characteristics and employment of our weapons. We must know the capabilities of the enemy force and be

able to analyze correctly enemy tactics and strategy. We must employ our forces with the greatest consideration for economy, always dispatching the proper force to accomplish the mission and never dissipating our forces on unremunerative objectives.

We must keep our "eye on the ball," adhering to the objective of our air operations. By this we mean that we must not divert our forces to the attack of targets other than those which are included in our system of objectives and which are vital to the enemy in his military operations.

Finally, we must plan our operations with an offensive spirit, exploiting to the fullest the great capabilities of speed, maneuver, and fire power of our aircraft.

The Birth of the Balloon Barrage

(From a British source)

BALLOON testing was started in Britain about two years before the war began, by a crew of two pilots and three scientists.

Before the experiments it had not been decided whether the balloon barrage should be adopted as a form of defense. The testers began by dropping a ball of string with a parachute attached to the upper end of the string, then wheeling around and flying into the length of string. The aircraft used were Hawks which had wooden wings.

The first thing discovered was that before the string broke it sawed into the leading edge of the wing. An important further discovery was that the depth of the cut depended on the length of the string. The longer the string the deeper the cut.

Before starting each flying experiment, the whole thing had been worked out on the ground mathematically, so the pilots did have an inkling of what to expect, and on every flight one of the scientists flew with them.

After the string stage they started using steel wire of various lengths and thicknesses. The fliers wore padded crash helmets and

their cockpits were protected by a steel netting with a peephole so that they could see clearly to aim at the particular point of the wire that they wanted to hit. This spot was marked by a black flag.

For this wire testing stage they used single engine bombers with metal clad wings. They did their flying over gunnery ranges, so that the falling wire should land where it could not do any damage on the ground.

Sometimes the wire got tangled round the propeller and its hub, or became lashed round the cockpit or the wings, often gashing them to pieces. After each contact with the wire they would land to inspect the damage and measure the depth of the cut in the leading edge of a wing. They never had a wing cut right off, but that was because the experiments had taught them by then exactly how far through a wing the cut could go without this happening.

The third and last stage was flying into steel wire cable with a real balloon at the top. The effect on an aircraft of hitting a cable is to slew the machine round and down. It was then decided to adopt the balloon barrage.

Panther vs Panzer

MAJOR GILBERT A. ELLMANN, *Field Artillery*

NOTE: The combat actions described herein are not necessarily in accordance with the latest tank destroyer doctrine, but resulted from the exigencies of the North African situation. Since then, many tank destroyer battalions have been equipped with weapons specifically developed for accomplishment of their primary employment in accordance with their doctrine, with successes that have amply justified their existence as a tactical force.—THE AUTHOR.

THE "cry of the panther" in the jungle has at last been duplicated in the "cry of the panther" on the modern battlefield. Symbolically embodying in their basic tactics the stalking technique of their counterpart, "the black panther," the tank destroyers have further improved in seeking out their prey, the enemy armor; and, lying in wait for him, by use of surprise and massed fire, have been extremely successful in the accomplishment of their mission.

In the first months of the North African campaign, the need for antitank weapons was so great and the available tank destroyers so few that the tank destroyers were parcelled out to various units by platoons and companies. At no time during these early months was a tank destroyer battalion employed as such; however, employed on a piecemeal basis, they were called upon to perform many missions for which they were neither designed nor well suited, such as unsupported rear guard actions, direct assault against fortified towns, and as general assault artillery. Despite the resulting loss of concentrated fire power, tank destroyer units functioned successfully, fulfilling many roles aside from those primary and secondary missions set forth in Training Circular 88 (Employment of Tank Destroyer Units, WD, 24 June 1943).

Company "B," 701st TD Battalion, under the writer's command, was the first TD unit to see action against the enemy in Tunisia,

making initial contact on 22 November 1942 and continuing in action throughout the campaign. The company, with a reconnaissance platoon attached, functioned almost entirely as a separate unit, at times even being broken down into separate platoons.

The action of this tank destroyer company at Gafsa and Sbeitla are cited here as examples of successful though unorthodox employment, a success which was due to the combination of aggressive leadership and initiative on the part of platoon commanders,

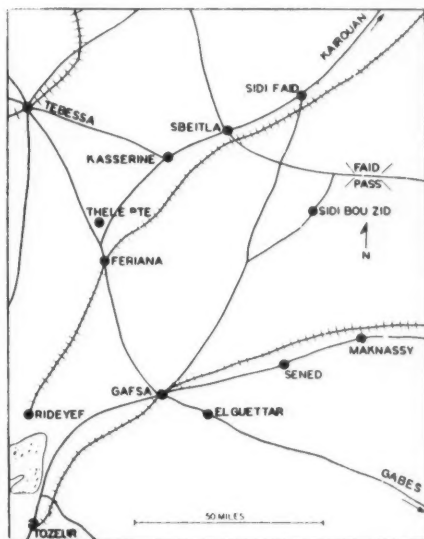


FIGURE 1.
CENTRAL TUNISIA.

and to enemy errors. We attacked without infantry support, which, against an alert enemy, could have led to disaster; but we cannot expect to surprise the enemy as often as was done at Sbeitla, where our boldness was matched only by the enemy's utter disregard for the remotest pretense of local security.

So, lest we forget the early baptism of fire and the trials and errors, this article will

endeavor to give the reader a little insight into the early fighting by the tank destroyers in Tunisia.

After traveling overland for six days the company reached the little town of Feriana (Figure 1) at about 0230 on the morning of 22 November 1942, only to be told by the "Tunisian Task Force Command" there that

time to leave on the trip to Gafsa, forty-seven miles away.

The absolute absence of any information on the enemy forces made it wise to keep the light platoon (37-mm SP) in the rear of the column because of their vulnerability to small-arms fire, and thus with the two platoons of destroyers (75-mm M3 half-tracks)

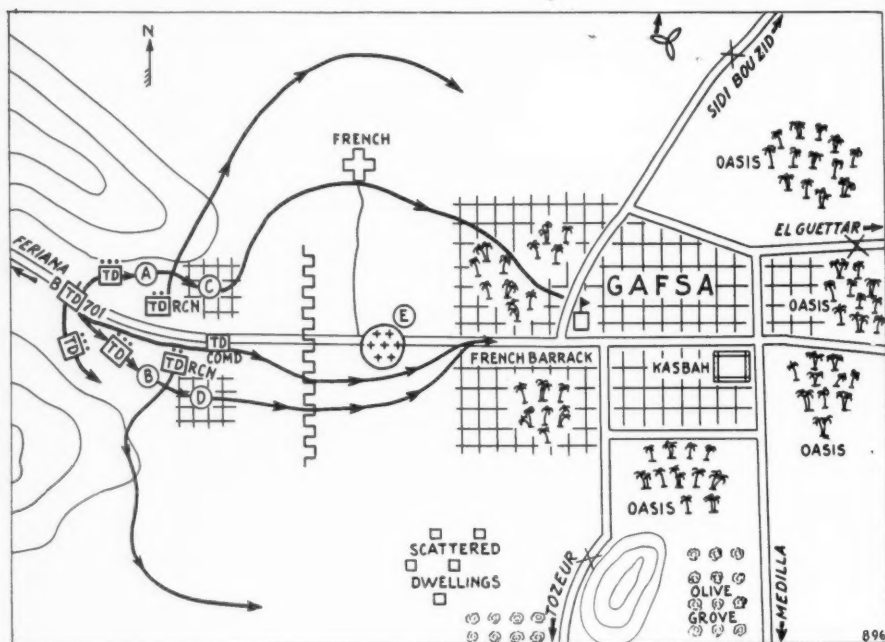


FIGURE 2.
GAFSA.

it was to be prepared to attack the enemy-held town of Gafsa at daybreak. IP [initial point] time was 0300. Supporting troops totaled two antiquated French armored reconnaissance cars and two P-38's which were to strafe the town just before our attack. This, in retrospect, could have been much like a small boy stirring up a beehive with a stick just prior to attempting to capture the queen bee barehanded. However, after refueling and making ready for the trip into and against the unknown, everyone slept until

used as assault guns, the attack on Gafsa was begun (Figure 2).

To the reconnaissance platoon was given the mission of proceeding directly toward the town but off the road until the first hostile elements were encountered. Then, in order to avoid any enemy planned defensive fires, it was decided that only by a wide flanking movement by one platoon and a dispersed frontal attack by the other 75-mm platoon (A and B in Figure 2) could hope for success be possible. The reconnaissance platoon re-

ported first contact with the enemy and the agreed-upon plan of attack was immediately put into execution. Meanwhile the reconnaissance platoon divided into sections, one going out to either flank to warn us of any flanking attacks by the enemy. The French armored cars were lost to the attackers early, by running into a mine field (E in Figure 2)

with about 300 Arabs who had been armed by the Germans.

All-around defense was immediately established (X's in Figure 2) and the success of mission No. 1, though unorthodox, became an accomplished fact.

That same afternoon word was received through the French warning system that an

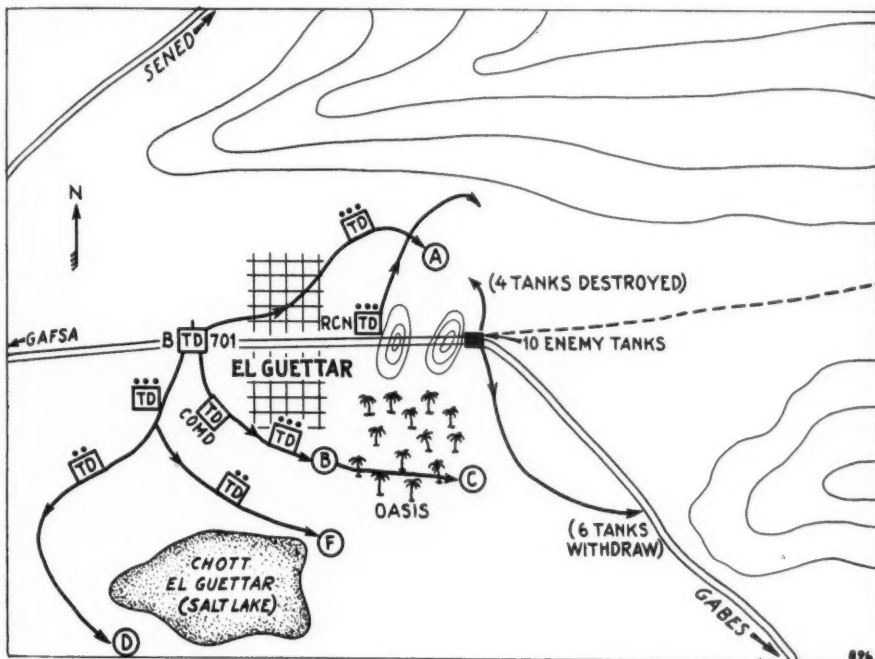


FIGURE 3.
EL GUETTAR.

on the main road, one of them losing all four wheels.

After effectively eliminating the German snipers in the outlying buildings (C and D in Figure 2), using 75-mm high explosive, one platoon (A in Figure 2) made a flanking attack on the town while the other platoon (B in Figure 2), plus the command group, entered the town, and with the volunteered aid of a young French civilian, cleaned out the remaining German snipers together

enemy tank column was approaching Gafsa from Gabes, the enemy stronghold in the southeast, with the evident intention of retaking Gafsa (Figure 1). Despite the fact that everyone needed some sleep and rest, it was decided that the terrain around Gafsa afforded little opportunity for a successful battle against tanks, so at 1430 the company moved out in the following march order—reconnaissance platoon, one 75-mm SP platoon, command group, the second 75-mm SP

platoon, and followed by the 37-mm SP platoon. This formation was to prove very effective in this and later battles since it afforded initial fire power to support the reconnaissance platoon and at the same time the lead gun platoon also served as a base of fire, permitting the advantageous use of the second gun platoon for a flanking movement or any other appropriate maneuver.

The unit approached El Guettar in an atmosphere of complete serenity, wanting to pick good firing positions and then, by surprise and massed fire, achieve a quick victory.

The main body of the company was just entering El Guettar (Figure 3) and the $\frac{1}{4}$ -tons of the reconnaissance platoon were topping a rise just east of town when facing them over the top of a second rise were the enemy tanks.

Surprise at such an abrupt meeting did not stop the reconnaissance from reporting the tanks' position and range, even though one jeep driver spilled his passengers and overturned his jeep in his hurry to get some solid African dirt between him and the muzzle of the lead tank. The man managed to get back safely.

The fight was on. Based on the reconnaissance reports, the company commander sent one platoon (A in Figure 3) to the left of the road and accompanied the other (B in Figure 3) to the right. The left platoon got four tanks immediately while the right platoon scoured the oasis for any more that might be hidden there. Moving to the edge (C in Figure 3), they attacked six tanks that tried to swing south; none was knocked out, but all were later picked up, out of fuel and damaged, a short distance on the way back to Gabes.

During all this action the 37-mm SP platoon had been kept in reserve and was sent out around the salt lake south of the oasis (D in Figure 3) to prevent the company from being outflanked and also to act as rear guard.

At 1700 the company was reformed and went back to Gafsa.

In this last battle, again were violated the most recent doctrines of tank destroyer employment, namely—to go out and seek hostile

tanks. However, here it was necessary to meet a definite situation and it was necessary to pick out favorable ground. TD's, to assure their success, must of necessity have time to select and occupy positions favorable to them in advance of the arrival of the enemy.

Returning to Gafsa at about dusk with anticipation of much-needed sleep, the writer was met with the news that the Germans had captured Sbeitla (Figure 1) about 120 miles to the north, and along with it large quantities of French equipment. While the company's newly found importance to the capture of Tunisia was greatly appreciated when the French asked the TD's to go up there and do something about it, it was felt, too, that the men had already passed the point of human capabilities to go without sleep. However, it was known there was no one else to call upon, and with Sbeitla in enemy hands Gafsa would have been untenable, as was later borne out by the evacuation of Gafsa in February when it became impossible to hold Sbeitla against superior German panzer elements.

The 37-mm SP platoon was left behind to help hold Gafsa in support of one infantry company, part of the 1st Division, while the remainder of "B" company started back for Feriana at about 2230 that night and spent the few remaining hours before dawn preparing for the next mission and getting two hours' sleep.

Dawn on the 23d saw the company beginning its seventy-six mile march through Kasserine to Sbeitla, using the same formation as previously. This became known as Plan A. However, because of lack of further enemy information other than that he had come as far as Kasserine, and expecting to meet him coming toward Thelepte, the company traveled in staggered formation on the road so that each gun would have a field of fire to the front. The reconnaissance platoon had been given orders to do a particularly thorough job.

Because of the similarity between this march and the surprise meeting encountered at El Guettar, one 75-mm SP was placed up front in the column just behind the reconnaissance so that if they were surprised again the TD could open fire immediately. It

ceeding on its way and about five miles out encountered a stone road block appropriately well placed in a defile. Anything was expected to happen at this point, but for some unknown reason it was neither booby-trapped nor defended. A little pioneer work soon cleared a passage and the company advanced.

At this point a light, cold rain developed and further strained the already taut nerves of the men who were eager and alert trying to catch sight of the enemy before he saw them. The odometers showed that the company was almost there.

showed the road as entering Sbeitla from the southwest, all were again surprised when, approaching from the northwest and topping a rise, the reconnaissance saw the town lying out before them (Figure 4). However, no contact was made by the reconnaissance until the outskirts of Sbeitla were reached, later ex-



ceeded on its way and about five miles out encountered a stone road block appropriately well placed in a defile. Anything was expected to happen at this point, but for some unknown reason it was neither booby-trapped nor defended. A little pioneer work soon cleared a passage and the company advanced.

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plained by the fact that, it being noon, the enemy was eating.

The reconnaissance halted and observed the edge of town but saw nothing, then moved ahead and had covered about half the distance to the town proper when everything broke loose.

An enemy tanker saw the jeeps about the same time the reconnaissance spotted the tanks well hidden in an orchard and all facing them. The tanker gave the alarm and raced for his tank as the lead reconnaissance jeep warned the company.

A hot fight followed with the enemy open-

ing up with machine guns and 47-mm tank guns, and the lead destroyer firing over the dispersed jeeps as the commanding officer of the reconnaissance platoon marked targets with tracer .50 caliber. The jeeps also opened up with their .50 caliber machine guns to keep the tanks buttoned up.

As soon as the enemy position was definitely established, one platoon was sent to the left of the road (B in Figure 4) from where it opened fire on the tanks. The reconnaissance platoon was split, one section going to the left to help protect that platoon from enemy infantry, while the other section took up position with the other TD platoon behind a hill mask (A in Figure 4). From here, this platoon took up the fire fight, thus enabling the platoon on the left to flank wide to the left unobserved, where it took up a position near an old Roman arch (C in Figure 4).

With the platoon in these positions, a cross fire was formed, and no matter how the tanks moved they met the tank destroyers' fire. The destroyers knocked out eleven enemy tanks and had one of their destroyers hit, immobilizing it. It was only by this unlucky hit that several trucks and three tanks succeeded in escaping out of town the back way.

The destroyers were ordered to close in cautiously and to pour it on, and in this way, by firing heavily with high explosive and overrunning machine guns at several street corners, the company entered town.

The booty consisted of nearly a hundred prisoners, who were rounded up, searched, and sent to the rear, as well as quantities of equipment and supplies, including much captured French equipment.

Some paratroopers finally assisted in mopping up, and after the French sent in an infantry company and an artillery battery to take over, the company turned the town over to them.

A check of the tank destroyer company's condition turned up these facts: that in four days since leaving Constantine it had been in three actions, winning them all; taken over four hundred prisoners and much enemy material; knocked out fifteen tanks; and traveled some four hundred miles. The only casualties were one man wounded and two vehicles slightly damaged. And now it was going back to Kasserine for its first real sleep in four days.

Japanese Military Characteristics

THE JAPANESE officer, be he a career or reserve officer, is a magnificent leader of men. His weakness consists in his failing to remain master of a combat, as European officers do. He goes through with a battle rather than directs it. His courage and conception of honor are far more inspired by a warring passion than by a real and realistic understanding of the necessities of the craft of arms . . . The Japanese is more of a warrior than a military man, and therein lies his weakness. The difference may be a subtle one, but it does exist: the essential quality of the warrior is bravery; that of the military man, discipline. The Japanese soldier has not the

same feeling for discipline as the European; this is due to the feminine and emotional quality of the race, which makes the Japanese lose the control of their nerves. I was struck by the veritable war hysteria which seizes the Japanese soldier and makes him seek a hand-to-hand fight with a disdain for death that would lead to frightful massacres were the Japanese to face an enemy endowed with calm nerves and well equipped with automatic arms.

—Robert Leurquin, observer with the Japanese armies in Northern China and at Shanghai, in *Army Quarterly* (Great Britain) April 1938.

Jungle Transportation

MAJOR J. C. JEFFERDS, JR., *Ordnance Department*
Instructor, Command and General Staff School

The following notes on jungle transportation are a condensation of information received from many sources; official combat reports, training literature published in the South Pacific and in India, and personal reports of individual observers. The purpose of the article is to present some of the logistical problems faced in jungle or semi-jungle operations, but not necessarily to offer any solution to these problems.—THE AUTHOR.

SUPPLY is said to present one of the greatest, if not the greatest problem faced in jungle operations. With proper prior planning, the problems of supply can almost always be reduced to problems of transportation. It is with some of the problems of transportation that this article is primarily concerned.

When approaching this subject, it is well to remember that several different types of terrain, all difficult, must be considered. In flat areas, with relatively thin undergrowth, the problems are minimized. In flat areas covered with heavy jungle undergrowth or thick grass, such as the Kunai grass of the Markham Valley in New Guinea, transportation becomes more difficult. Mountainous terrain where trails are nonexistent, or at best very poor, offers a real test of the adaptability and ingenuity of personnel concerned with logistics. There is no one solution to these problems; rather, one must have a thorough knowledge of the means available and then use common sense in applying those means to the problems faced.

Let us consider the types of transportation available in the jungle. In general, there are the same three standard means of transporting supplies that would be found in any area: by water, by air, and by ground transportation.

Of these, the best, where it can be used, is water. Comparatively large amounts of matériel can be carried in native boats or in our own small boats. Transportation by

water is faster, and there is not the great strain imposed upon men and matériel by the struggle of cutting and fighting their way through the jungle. Operations along a coast present maximum opportunity for the use of water transportation; a good example is the campaign in northeastern New Guinea. In inland operations the line of advance may follow a stream line, in which case the stream may be used. On occasion, the line of advance has been perpendicular to the direction of the stream line. Even if this seems to be the case, plans should be developed for the procurement of small boats in order that advantage may be taken of a change in direction of either the advance or the streams.

Next, a word about the capabilities and limitations of air supply. If a landing strip is available in the operational area, supplies may be flown in directly, field to field. This type of operation may assume major proportions and has supported large units in active combat.

In the absence of an air strip, supplies may be delivered by dropping. This is normally an emergency measure and not applicable to the support of large units for extended periods of time, although one instance of supply to one infantry battalion plus a field artillery battery for five weeks, by air dropping alone, has been recorded. Obviously, supplies can be flown into places which even native porters cannot reach. Also, once the supplies are in the air, air supply is fast as compared to ground supply. The disadvantage is the relatively small load which can be delivered by dropping. This is not so much a matter of the tonnage capacity of the plane, for a 5,000-pound plane load is tremendous in comparison to that carried by a porter or mule, but is a matter of getting the supplies out of the plane and onto the ground. Supplies may be dropped either with or without parachute, but in either case the size of the individual packages is quite limited. To drop a full plane load, the cargo plane must circle the landing

point a number of times. If there is any enemy air resistance, this may be asking for trouble, for unless complete air superiority has been achieved, cargo planes are *always* vulnerable. There is still another important disadvantage which, as is indicated by the following quotation from a report on the recent campaigns in New Guinea, applies primarily to units operating in mountainous terrain, but which also applies, to some extent, to any dropping operation: "Dropping of supplies by air in mountainous country is costly, undependable, and wasteful, both of supplies and manpower. This method of supply should be resorted to only in the greatest emergency. It is difficult to indicate a dropping ground, and once established, pilots have difficulty in locating the ground or dropping supplies on it. Unless parachutes were used there was great wastage due to broken or lost containers and exposure to rain. Recovery of food and other supplies dropped without parachute varied from 40% to 75%. Recovery of ammunition dropped by parachute and special carrier, however, averaged 85% to 95% with little or no damage resulting." Remember, however, that there are times when air dropping must be used, despite the inefficiency. As new equipment and methods are developed, and as personnel become more expert, air dropping is becoming more and more efficient and extensive use of this means must be anticipated.

Let us consider the use of the pack mules. They can be used forward of the point where all motor transport must stop. There are, however, a number of limitations to their use. One is the amount of food that they require. Pack animals can subsist for only a short time on a concentrated grain ration. They must have a bulk (hay or some substitute) ration in order to keep going. One grain ration weighs ten pounds and a hay ration about fourteen pounds. With an average pay load of about 200 pounds, or less, per mule it is obvious that carrying twenty-four pounds of rations per day per mule would make their use prohibitive. If possible, the mules must be trained to eat the grass, various types of shoots, and leaves which grow locally, thus

obtaining their bulk ration. Unfortunately, this has proved to be almost impossible in most South Pacific areas. A much better solution is to procure animals from the area in which operations are to take place. Another solution is to limit the distance traveled by the mules so that a round trip from the mule bivouac to the using units can be made in one or two days. Then the grain rations can be hauled in to their bivouac area by $\frac{1}{4}$ -ton trucks or other means. If the mules are to be out of touch with their supply base, the grain ration must be packed with their pay load.

In two other respects mules are definitely inferior to native porters. Many of the jungle trails are so narrow or so precipitous that they are impassable for loaded mules. This particularly applies to our big U. S. mules which are much larger than mules (burros) native to the areas in which our forces are operating, but carry no greater load. Many of the trails have so soft a bottom that, although they could be traversed indefinitely by men alone with little harmful effect, mules will churn them up and make them unfit for any use. Before deciding just where mules can be used, it is necessary to make ground reconnaissance.

Native porters can be used where even mules cannot go, but there are definite limitations to their use. They cannot be used where they will come under enemy fire. This is no idle statement. The Japs have, in at least one operation, lobbed shells at random into our rear areas just to scatter the native porters. It was effective. It has been reported that one-man loads are more practical than two-man loads, since a porter carrying a single load will duck into the jungle when fired upon, taking his load with him, and probably will return eventually with the load intact. If porters carrying a double load are fired upon, they immediately drop the load, and if it falls into the mud or water it may well be given up for lost. Another definite limitation upon their use is the load that they can carry. Their loads should weigh between thirty and forty pounds, with an absolute maximum of fifty pounds for short periods.

They eat about two and a half pounds of food per day.

Native porters must be carefully handled. A conference given at an Officers' Candidate School somewhere in the South Pacific on the subject of Transportation by Native Porters states that "natives are under no obligation to work for whites. Trouble in villages or desire for trade are usually the only reasons for working at all." There is an exception to this, however, in that the natives on certain islands mandated to Australia can be ordered to work by the Australian Government. Money is, as a rule, of little use for paying native labor. Trade goods are of greatest value, tobacco being best of all, although shell or mother of pearl may sometimes be used in interior regions.

In the early stages of operation in New Guinea, the Allies had little trouble in obtaining native porters, for the Japanese had treated the natives so badly that they were most willing to serve against them. This is no longer entirely true, however.

Where they can be used, $\frac{1}{4}$ -ton trucks, "jeeps," are most valuable. This also applies to the $\frac{3}{4}$ -ton truck. The jeep's 500-pound capacity seems small compared with a cargo truck, but is large when compared to that of a mule or native porter. Most of us feel that a jeep can go almost anywhere, but parts of the jungle stop even the jeep. When we consider the type of trails which must be used in the jungle, it is easy to understand why even the jeep meets its match.

Many of our units are equipped with hand carts. These have a carrying capacity of roughly 500 pounds. Native carts, which may be procured locally in some areas, for example, Burma and the Malay Peninsula, have about the same capacity. These carts may be used over trails that are impassable to jeeps

and where they can be used are of great help. The GI hand carts have standard modifications which fit them for carrying machine guns, mortars, and equipment, as well as general supplies.

To sum up the transportation picture, another quotation may be given from the South Pacific OCS conference mentioned above: "General supplies are transported from the Supply Base (or advance landing field) to the using troops as follows: From the Supply Base (or advance landing field) to the road head by normal motor transportation, by jeep as far as jeep can be used, by pack animals to the end of the animal track, by native porters to the using troops." In other words, use the best means available, and when it can be used no further take the next best.

In conclusion, it should be repeated that in jungle warfare loads must be kept to a minimum and every possible means of transport used, and that tactical planning absolutely depends upon whether or not the contemplated operations can be supplied. The following is quoted from a New Guinea report: "Supply is extremely difficult, even under the best conditions. Pilferage of such items as canned fruit, coffee, and cigarettes along the supply lines resulted in a critical shortage at times in the front line. Additional difficulties encountered were long water supply lines, shortage of boats, insufficient tarpaulins to protect supplies from rain and sea, insufficient loading and unloading personnel, improper or careless handling, improper packing of containers for perishable items such as signal batteries, rice, flour, sugar, etc. In general, it was found that an additional allowance of approximately 30% should be shipped from the base to take care of shrinkage due to causes enumerated above, and that special provision should be made to eliminate such losses and wastage."

Fortifications may be either the most useful of strongpoints in the maneuver of the command, or, on the contrary, dangerous impediments to liberty of action.

—From Colonel Frick's *Tactical Breviary*,
quoted in *Revue Militaire Suisse*.

Use of Local Resources

LIEUTENANT COLONEL H. R. EICHENBERG, *Quartermaster Corps*

IN THIS global war where tactical requirements are often intermixed with ideological or psychological considerations we find American Army installations based in many out-of-the-way places, including countries which officially are not at war and where our presence is technically non-military. This substantially was our position in the late fall of 1942 when it became necessary for the then expanding Persian Gulf Service Command, in order to conserve tonnage, to resort to limited local procurement. Here the factor of "the needs of the local population" came into serious play—but of that later. First, an explanation of what the command is and the reason for its existence. The Persian Gulf Command was formerly the Persian Gulf Service Command and is an outgrowth of the old U. S. Military Mission to Iran. The mission of this command is to expedite and facilitate the delivery of United Nations aid to the armies of the U. S. S. R.

It must be understood that, at the time, Iran was not at war with the Axis powers, but was occupied for security reasons in the southern part by British forces, and north of Tehran by the Soviet forces. From the Persian Gulf to Tehran the railroads as well as the highways were being operated by the British jointly with the Iranian Government, and from Tehran to the Caspian Sea similar operations were under the auspices of the U. S. S. R. Into this picture, in order to expedite the delivery of aid to Russia, stepped the U. S. Army, to take over the development and operation of the ports, railroad, highways, and other facilities necessary to carry out its assigned mission effectively. The theater area is composed primarily of the countries of Iran and Iraq, with most of the operations in the narrow corridor of the Trans-Iranian Railway and the main cross-country highway which runs from the Persian Gulf to the Caspian Sea.

Iran, with a population of 15,000,000 people and an area of 1,645,000 square kilo-

meters, can really be divided into two major parts: the southern portion, which in climate borders on the subtropical and is mostly arid desert; and the central and northern part, which consists of a high plateau with a range of mountains running through it and sloping down the Caspian Sea, and which has a varied climate. Here agriculture is highly developed, some industry is in process of development, and a fast growing lumber business can be found. In this area Tehran is located. There are other large cities in the country, but from the industrial viewpoint Tehran is the prime center, although a substantial cotton textile and blanket industry is under development in the city of Isfahan. In the southern part, except for oil, no industry of consequence exists.

Tehran, scene of the Tri-Power Conference and capital city of the country since 1788, has a native population of 750,000, swollen by refugees of many nationalities and by Allied troops, including several contingents of Poles. It boasts a most up-to-date railroad station, broad avenues, excellent radio broadcasting facilities, fine shops, and a growing manufacturing center. From the American industrial point of view, both city and country are considerably undeveloped, although before the war much work had been done by the government towards industrialization with the aid of foreign engineers. German commerce and industry also had made deep inroads into the country.

At Tehran, for example, there were a large arsenal plant and a gas mask factory with potential facilities for the production of rubber items, clothing, etc. Because of lack of raw materials as well as needed replacement parts, these plants were standing idle. Two large warehouses and some others were found available for potential use. Most raw materials and semi-finished goods as well as finished articles were imported, and because of shipping and currency controls, imports were reduced to a bare minimum. But the real heart of the nation's commerce was lo-

located in Old Tehran, in its teeming bazaar. The bazaar, a mixture of the color of the Orient with a modern tinge of Europe and America, composed of alley upon alley interlaced into squares and joined into a brick framework, consisted of hundreds of small shops and held within its walls thousands of dollars worth of goods. From Kerman carpets to Yale locks, from German-made typewriters to Russian-made electric fixtures, the manufactured goods of the world were concentrated into this small bit of the city.

Business and manufacturing as well as trading are done in the old-fashioned manner. The system of a "firm fixed price" is known and smilingly accepted, but the common method of trading, though assisted by the modern adding machine, is still as of old. Bargaining, counteroffers, long-drawn-out discussions on the merits or demerits of the merchandise, the inevitable glass of tea, are all part of the transaction. If a large quantity of goods is involved, the local custom is to use commission brokers. Much as we deprecated doing business with brokers, we soon found that with limited stocks, language barriers, and other difficulties, if we were to get emergency supplies we had to adopt local methods and do business with brokers. And they served a good purpose. Brokers usually knew the location of supplies otherwise unobtainable, and as they were most anxious for the prestige of doing business with the Americans, we were able to get supplies through them in half the time a transaction normally takes in that part of the world. Emergency purchases, which meant immediate action, were unheard-of in the Middle East, for time here is never a factor and local people could never understand our insistence on time schedules, dates of delivery, etc. It was always agreed to with most earnestness that there would be no delay, delivery was to be immediate, but in actuality it meant the day after tomorrow.

An unforgettable event was the daily call of the local salesmen. Sales representatives as we understand them are rare, the major business being done through brokers. It was standard practice for an officer to interview

each broker. The broker having access to the goods, and often two brokers who represented the same item, would not offer it but wanted to know what the Americans would buy. In doing this the inevitable brief case, without which no responsible broker travels, is opened and a letter of reference including past business done is produced. The officer usually countered, "What do you sell?" the broker's answer being, "Anything you need." To the query of the officer, "And why do you wish to sell us an item which is so short on the market?" the answer in all earnestness would be, "Because I love the Americans." In months of doing business with the local people this formula never changed.

These people had heard of our country, had seen our movies, saw our equipment and our clothing, our standard of living. To them we were the epitome of success and attainment. Business rivalry was keen—and everyone was anxious to please the Americans. But how to get to do business with Americans? It is not uncommon throughout the East that someone opens the way, usually for some consideration. This, of course, lends itself to all and sundry sorts of problems. Our system, where anyone could come in and offer us goods, was not understood; ergo, the brokers came into the picture. As time went on we were able to eliminate brokers, except in rare cases.

Methods of manufacture were also different. There were plenty of craftsmen available, excellent workers, whose daily income by our standards was a pittance. These craftsmen could reproduce anything if a full scale model was given them and no rush was involved, but the setting up of an original model based on drawings or specifications was always dangerous. Dies, jigs and gauges, etc., are very uncommon. The artisan, given a model, with the crudest of tools could reproduce an excellent copy. Enough can not be said for the desire of the workmen to do a job that looked good, but they never could be rushed. Some of the work done for the U. S. Army was in what could be called modern plants, but most of it was done in small shops or in the yard back of the house,

often under conditions which left a lot to be desired. But with the exercise of tact, with patience and by example, our inspectors were able to make changes, develop acceptable standards, and get results.

In this background, the Command set up one of its three principal procurement offices. The directive called for centralized local procurement and for the handling of reverse lend-lease procurement from our Allies. The procurement office in the south was primarily concerned with reverse lend-lease, being located closest to a large Allied supply base, whereas the Tehran office was concerned with the use of local commercial and manufacturing resources. In setting up the Tehran office, the problems were (1) to develop local resources, (2) to locate available supplies and make use of the same, (3) to be sure that due consideration be given to the needs of the local population, and (4) to coordinate all procurement with similar activities of the British and U. S. S. R., and of the other United Nations installations established in Iran. This involved contact with the United Kingdom Commercial Company (UKCC), Iran-Sov-Trans., Middle East Supply Council (MESOC), and the Ministry of Supply of the Iranian Government. The office, in addition to the usual sections of a procurement office, had a Reverse Lend-Lease Section, a Production Expediting Section, and an Economic Resources Section. This last section had the job of locating supplies and comparing prices.

Having adopted local business methods, we were able to develop a close check on actual available commodities and current day-to-day price range, as well as to check the consumer demand of the local population. This was done by utilizing the information furnished by brokers on supplies available and on current prices, and by resorting to the simple expedient of a cross-reference index as to resources, supplies, and prices, and by the additional method of a comparison shopper service composed of several trusted natives who went about the bazaars and local stores and tested prices for selected items, items being constantly changed. Since price

was a prime factor and since inflation had always to be reckoned with, it was also found that the method of purchase by bids or through open negotiation was not workable, and that private negotiation was the most advantageous solution of the problem. Though this method is often fraught with danger, it was most advisable, first, for security reasons, second, for psychological reasons, and third, to maintain price. In a market of rising prices, a demand for goods promptly resulted in raising costs; hence, advertising was out of the question. For this reason it often became necessary, in order to avoid a market upheaval, to delay a procurement for several weeks, no matter how urgent its need might be, or to separate a procurement into several small lots or into repeat buys. This avoided giving a possible combine a chance to raise prices, had the effect of distributing business among several concerns, and was sound from a security angle since it did not disclose information which might otherwise be deduced from a large procurement.

As to prices, no measure of comparison can be made with American standards, but to mention some, a 1942 Buick sold locally for \$21,000 and one 100-watt electric bulb as high as \$7.50. Another local phenomenon was that unit prices increased with greater volume, so that while one broom might cost \$2.00, a dozen brooms would cost \$3.00 apiece, since the local dealer would rather keep his goods than sell them, for as a rule items sold could not be replaced by him except at a higher price.

An attempt to effect our purchases through existing British procurement offices was made, but due to different methods and because our local procurement was only to meet emergency requirements the local British system did not lend itself easily to our needs and separate offices were set up. However, close coordination was established both as to requirements and price levels, and whenever possible the "Major User Policy" method of procurement was utilized. This method, which was used among the several British services which were operating their

procurement along decentralized lines, was adopted by us and it worked well. Under this method the Major Using Service procures the item involved and then allocates, by proportion, the item to the requiring (using) service. For example, the U. S. Army was the major user of brick; therefore, it was a U. S. Army responsibility to arrange for the anticipated needs of all forces, and if the local Polish Commandant or the British Royal Engineers required 20,000 bricks, the purchase request cleared through the U. S. office and a source was allocated to furnish the item. All business thereafter, including payment, was done direct between buyer and seller, without further reference to the major user. This method was especially useful in the case of construction supplies. Since the British forces were the major users of construction supplies, U. S. procurement for these items cleared through them, mostly on the basis of reverse lend-lease, and simplified the problem considerably.

Another way of coordinating procurement and maintaining price ceilings was through the local Allied Purchase Control Committee. This committee was set up at the request of the Iranian Government. It was composed of representatives of the British Purchasing Offices, the Local Resources Officer, GHQ, Paic force, the U. S. Army, MESC, and UKCC. The MESC representative was concerned with civilian import needs, and the UKCC was concerned with special buys for British forces and with purchases for normal export. The committee was presided over by the senior officer, which in this case was the British Military Attache. When necessary, representatives of the Iranian Ministry of Supply also took part in its proceedings. This committee, in addition to supervising price ceilings, was also concerned with maintaining an adequate supply of imported commodities to meet civil needs. Therefore, each procurement, except in an emergency, had to clear through the committee and its need had to be justified. If the need was to meet an operational necessity, then there was little question as to its clearance; otherwise, procurement was only

made if it had no adverse affect on civilian requirements. The committee did a great deal of valuable work, and its control was most effective and, of course, most necessary. Throughout all these activities the cooperation received from the Allied procuring offices was excellent.

In addition to all these considerations, there was always another thought that had to be considered. It can well be understood that, in a country where Axis propaganda previously had made deep inroads, rumors were a flourishing business. With the bulk of the population illiterate, word-of-mouth was the common way of getting news out, and any act, innocent or otherwise, was subject to rumor, usually unfounded; so that in considering a procurement there was the everlasting thought—"will there be psychological repercussions?" With a mixture of nationalities doing business in various localities, it was forever a see-saw to maintain a balance so as to avoid the possibility of a claim of favoritism, unjustified as it may have been. Another phase of this problem is possibly best shown by this instance. Except in rare cases the local procurement of food was prohibited. This had a most favorable effect on the local populace; what with lack of transportation, limited distribution methods, and a scarce crop, there was a most serious shortage of food in certain areas. However, in some districts vegetables were available and these in quantities beyond local need. If not used, they literally would rot. Procurements of these items were made, when authorized, with the assistance of local government representatives. But that often was charged with danger, for certain elements took advantage of every such move, and each such procurement always had to be evaluated in its effect on the Allied cause. For example, some time in the summer 1943, in a large city located in the heart of the vegetable belt, a most serious rumor broke out that food shortages were caused by the Americans buying food. This was obviously propaganda since no procurement of food, except for a few native drivers, was being made by the U. S. forces. Upon investigation, we found that the repre-

representative of the British Local Resources Officer had purchased certain vegetables, of which there was, by assurance of the local government, ample supply on hand well beyond the needs of the local population. Since this city was on the line which our empty trucks traversed on their return trip from delivering military aid to our Russian allies, it was but a natural cooperative act to use this transport for hauling these supplies to the British base, which was also on the same truck

route. Necessary countermeasures were taken and the rumor died.

Problems there were, of course, but a lot of this work would not have been possible except for the patient understanding by our superiors. And long after the last GI has left the good country of Iran, the excellent organization set up under the supervision of the Assistant Chief of Staff for Supply, P. G. C., and the Command Quartermaster will be remembered and its effect will be felt on the business life and industry of Tehran.

Preventive Maintenance

From an article by Major General D.R. Duguid in *The Journal of the United Service Institution of India* January 1944.

FROM the report of one officer who served in North Africa: "To the soldier on the battlefield a breakdown of his equipment may mean death. It is sad to be forced to admit that from a failure to recognize this fact in the beginning, far too many crosses now dot the desert. Our soldiers have had this lesson driven home to them by experience, and now

they have a better chance of coming home to us. They know that one loose wire, one faulty spark plug, one speck of dirt in the feed-line can put the best tank or the best airplane out of action. Fighting weapons today must be serviced continually. Adequately serviced, they will perform wonders, but woe unto the soldier and the unlucky ones, his comrades, if for one moment he relaxes his vigilance.

Bath and Clothing Exchange Service Raises Morale in Italy

AN experimental bath-sterilization-clothing exchange unit set up by the Fifth Army in Italy to service combat troops proved an unqualified success and was found to be an excellent morale builder.

The individual soldier, fresh from the front lines but otherwise not so fresh, walked into an undressing tent. There he placed his clothing which needed replacement in a hamper and the remainder together with his personal belongings in a bag which he re-deemed later by means of a tag. He was then given a cake of soap and a towel before proceeding to the showers. After his shower he was given clean clothes from the skin out, including, if required, field jacket, leggings,

and shoes. The entire operation took place within heated tents.

This experimental unit processed 2,000 men per day. Without exception all personnel so serviced were enthusiastic about the whole idea. The resultant lift in morale was reported to be remarkable.

Front-line divisions immediately requested that the service be made available on a permanent basis so that every man could be processed through such a unit at least once every two weeks.

The result has been a continuation of the service, under the supervision of the Army Quartermaster, and an SOP has been set up for processing.

A "New" Weapon--The 4.2-Inch Chemical Mortar

LIEUTENANT COLONEL ALBERT E. LINK, *Chemical Warfare Service*
Instructor, Command and General Staff School

LAST summer, at the time of the invasion of Sicily, the correspondents' reports published in this country began to speak of a "new" and potent weapon. This weapon was reported to be most effective in infantry close-support missions. Some of us suspected at once what the weapon was, and when it was finally identified as a larger and more powerful mortar we knew we were right. It was Chemical Warfare's 4.2-inch mortar finally being used in action by American troops, and justifying the faith placed in it by the small handful who really knew the weapon.

How did the Chemical Warfare Service happen to develop such a weapon? After all, when we think of mortars in our Army we instinctively think of the 60-mm and the 81-mm, both organic infantry weapons, developed by the Ordnance Department. To answer the question we should take a quick look at World War I. Not only was poison gas introduced as an effective means of warfare, but among the many effective weapons used was the mortar. One of the principal mortars used by the Allies was a British development, the 4-inch Stokes mortar. Both gas and the mortar were in a sense allied, called forth by the nature of the fighting.

After the opposing armies in the west went underground into their trenches and dugouts, the value of many weapons was seriously lessened. The machine gun, king of the battlefield against exposed unarmored infantry, could not shoot down into the trench. The artillery, even using howitzers, could not get a high enough angle of fire to drop the shell into the trenches and secure the desired effect without colossal shell ex-

penditure. Using enormous quantities of shell, it was possible literally to "chew up" the ground, including the trenches.

So these two developments, gas and the mortar, were introduced in an attempt to overcome the advantages of the trench. Gas was the only lethal means of warfare that could completely nullify the trench and dug-



A 4.2-INCH MORTAR IN ACTION NEAR SAN VITTORE, ITALY.
(SIGNAL CORPS PHOTO.)

out, and the German Army introduced gas to warfare. Among weapons, the mortar, because of its high angle of fire, always over 45°, could drop shells into the vertical slits in which men lived and fought. Both were a partial answer to trench warfare and both were most effective.

However, the Stokes mortar, at that time

a weapon of some 1,200-yard range, could be, and almost had to be, emplaced in front-line trenches in order to reach the enemy ade-



METHOD OF TRANSPORTING THE BARREL OF THE 4.2-INCH MORTAR IN MOUNTAIN OPERATIONS, DEMONSTRATED BY CANADIANS IN ITALY. (FROM THE LONDON "SPHERE.")

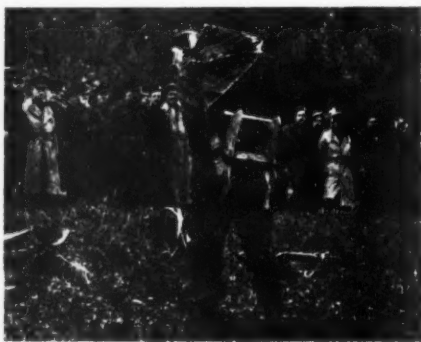
quately. In fact, for years after the war these mortars were called "trench" mortars because of their usual location.

The Stokes mortar was a successful weapon in spite of its defects. Stokes shell tumble badly and the mortar had a smooth bore, with resulting inaccuracy and limited range. However, on the plus side of the ledger, it was light, easy to emplace, simple, had a high rate of fire, and the shell could deliver a powerful punch, being about 100-mm in caliber. It was sufficiently accurate for smoke and gas use in static situations like trench warfare.

The Chemical Warfare Service took the 4-inch Stokes after the war and proceeded to develop it, primarily as a chemical weapon, the aim being to develop a heavy mortar that could fire a thin-walled, high-capacity shell rapidly and so be a first-class gas weapon. The barrel was rifled to increase range and accuracy, and then to permit muzzle loading an ingenious method was devised. At first thought it seems impossible to muzzle-

load a rifled weapon. To provide for this, a soft metal ring was fastened to the base of the shell. This ring is expanded by the explosion of the propelling charge and engages the rifling, and the shell is given the twist by the rifling. The 4.2 shell that has been used up to almost this moment was a chemical shell, the walls thinned to the greatest possible degree so that more chemical could be carried. The reason for this is that, in gas munitions, the case of the munition, be it bomb, shell, or grenade, is merely a wrapper for the contents. The thinner we can make the case and still have the munition stand up in shipping, storage, and firing, the more efficient a munition we have—for gas. When filled with liquid, a fixed vane is fastened inside the shell to give added flight stability by making the liquid rotate with the shell. With solid filling this vane is unnecessary.

In developing the mortar and getting the desired characteristics it became in effect a heavy mortar. To stand the setback of firing a twenty-five-pound shell at greatly increased ranges from a gun without recoil mechanism, the baseplate cannot be flimsy. Also, the



THE "YUKON PACK" USED AS A CRADLE FOR CARRYING BASE PLATE OF 4.2-INCH MORTAR UP A MOUNTAINSIDE. (FROM THE LONDON "SPHERE.")

barrel must be relatively heavy to stand high internal pressures.

The 4.2 mortar consists of three parts—barrel, baseplate, and standard. Total weight is 294 pounds, 91 pounds being barrel, 150 baseplate, and 53 standard. It can be broken

into separate loads and man-carried for short distances. Hand-drawn carts give good mobility for both weapon and ammunition when truck transport becomes impossible because of enemy fire. Jeep and jeep-trailer transport for gun, crew, and ammunition further increase mobility. It can readily be pack-carried on animals. The mortar can be emplaced and fired quickly—in a few minutes—in ditches, deep draws, or behind buildings, because of the high angle of fire. The silhouette is low, so it is easy to get enough defilade to hide it. The muzzle flash demands good defilade where it is available.

When we began the war, the official maximum range of the 4.2 was 2,400 yards. Range was greatly increased with a new type of propellant powder.

The chemical mortar has a tremendous fire capacity. Trained crews can fire over twenty rounds per minute from a single mortar, for short bursts of not more than two minutes. A sustained fire of five rounds a minute can be maintained for extended periods.

To employ the mortar, Chemical Warfare Service developed

a weapons unit. This unit is organized into a headquarters company and four weapons companies. Each weapons company has twelve mortars. Originally, the weapons company had two six-mortar platoons, but recently a change in organization has resulted in three four-mortar platoons per company, giving greater flexibility.

The forty-eight mortars in a chemical battalion can pour a staggering tonnage of shell on an enemy. In one minute, massed mortars of a battalion can fire 960 rounds. At twenty-five pounds per shell, that means 24,000 pounds, or twelve tons, per minute.

The 4.2 is some twenty years old, and no effort has been made to keep it a secret weapon. Quite the contrary is true. Chemical Warfare Service, through its Chemical Warfare

School and through all available channels, tried to familiarize the entire Army with this weapon and with its potential value. This publicity did familiarize the peace-time Army, but when the tremendous expansion began in earnest in 1940 most of the millions who became part of the Army had no knowledge of any weapon of war, much less the 4.2 mortar. To further aggravate the lack of knowledge,



A 4.2-INCH MORTAR FIRING AT JAPANESE POSITIONS ON ARUNDEL ISLAND IN THE SOUTH PACIFIC AREA. (SIGNAL CORPS PHOTO.)

Chemical Warfare Service had only a few of these weapons. Then in 1940 when the Battle of Britain was about to start, among the arms sent England to help repel the expected invasion were almost all of the 4.2's that were in existence. So the few mortars we had left were not sufficient even to train Chemical Warfare Service troops.

The British, working with the 4.2 in 1940, were quick to realize its value. They found that what Chemical Warfare Service had claimed for a long time was true, that the 4.2 ideally filled the gap between the maximum range of the machine gun and light infantry mortars, and the minimum range of light field guns. It could engage targets beyond machine-gun and light mortar range with a shell capable of accurate placement

and carrying a tremendous wallop in its seven and a half pounds of explosive, and do it so effectively that artillery was not diverted to engage close-in targets.

As a matter of fact, the British liked the 4.2 so much that they adopted it with almost no change, and today it is an organic weapon in the British infantry division. Actually, when this happened the chemical mortar completed its full cycle, from its origin in the British 4-inch Stokes trench mortar, through its modification and improvement in the United States, and back to the British for adoption as the 4.2 mortar.

Now let us look at mortars in this war. In so doing we shall see one of the real reasons for the 4.2's present popularity. The Japanese, the Germans, and the Russians are all believers in mortar fire, and in all cases had adequate heavy mortars. Not only were they believers initially, but combat experience proved the case. When we started offensive action, the only mortar ready for action of a "heavy type"—heavier, that is, than our 81-mm—was the 4.2, and not only was the weapon ready, but we had an organization ready to use it, in our chemical battalion.

In the Sicilian and the Italian campaigns, and now in the jungles of the South Pacific, it has proved its value. The chemical battalion, designed originally for the use of chemicals, should not have to shoulder the entire load of heavy mortar support, and as other heavy mortars become available it will not have to. The battalions were organized and equipped to fire gas and smoke, and until the war is over they must be ready to aid in retaliation upon the enemy with gas, if the Jap or the German elects to start gas warfare.

Now for some brief examples of the value of the 4.2 and of the chemical battalion since July 1943. It has proved of inestimable value in landing operations. The light weight of the mortar and its mobility, as compared with artillery, plus an organized unit to handle it, have given assault infantry a close-support artillery weapon in the very early stages of amphibious operations. Sicily proved that. The report published in the *MILITARY REVIEW* last November gives some details as to how it worked out. It can be mounted to fire from landing craft, and when so mounted it can produce effective smoke screens to cover the approach of the assault waves. When thus used it accompanies the first wave.

It has been used to repel tank attack, and successfully. The mere volume of fire seems to have been a major factor.

It has been used in all types of infantry close-support missions, firing both white phosphorus shell for smoke and antipersonnel effect, and high explosive, and has done it so well that the infantry swear by it and hate to go into action without it.

It has screened our advancing troops with smoke, reducing the effect of enemy aimed fire. It has flushed the enemy from gullies too deep for artillery fire and forced him out ready to surrender and asking to see this new "automatic artillery." Of course our troops have given it a nickname. They call it the "goon gun."

In the future the 4.2 may become more than a chemical weapon, and it may change its shape. But no matter what form it takes, it will still be the 4.2 chemical mortar at bottom, the weapon that the Chemical Warfare Service developed twenty years ago, and that has proved itself in that final test of all weapons—combat.

The commander who, when faced with an unexpected situation, remains inactive on account of the desire to conform too strictly with the orders he has received, is condemned to defeat; he is not fitted for the efficient discharge of the duties of command.

—General Leopoldo Mendez Lopez in *Memorial del Estado Mayor General*, Colombia.

Motor Transportation Requirements for Shipside Evacuation of Sick and Wounded

CAPTAIN THOMAS G. SCOTT, *Transportation Corps*

RECOGNITION of the importance of a smooth, uninterrupted movement of sick and wounded from hospital ships encourages evacuation personnel to refine their methods. To this end and in the interest of the Army conservation program it is desirable to make adequate and accurate estimates of motor transportation requirements. A technique for making such estimates has been developed and tested in practice at the Charleston Port of Embarkation, an installation of the Transportation Corps, Army Service Forces.

For purposes of sea evacuation patients are classified as follows:

1. *Troop Class*.—Patients who require little hospital care en route and who will be able to take care of themselves in an emergency.

2. *Ambulant*.—Patients who, while ambulant, require hospital care and the service of others en route.

3. *Mental*.—Patients who require security accommodations en route.

4. *Litter*.—Patients who must be moved by litter.

Specific consideration must be given these classes in arranging for motor transportation requirements. Ambulant and troop class patients are here treated as one group. These patients are transported by bus. A Medical Corps officer and the necessary enlisted attendants are assigned to each bus. It has been found that twenty-five percent of the rated bus passenger capacity must be reserved as a space allowance for personal effects in the hands of patients, attendants, and certain types of injuries.

Mental patients, for transportation purposes, must be treated in two categories: (1) violent and (2) non-violent. Non-violent mental patients are moved by bus with one enlisted attendant to each patient. One Medical Corps officer is assigned to each bus. Bus passenger capacity for this type must be estimated at two times the number of patients

to allow for the attendants. An additional ten percent of the passenger capacity is needed to provide space for personal effects in the hands of patients. Individuals in a violent mental classification are normally transported two to an ambulance; each one is accompanied by two attendants. Occasionally a patient is so extremely violent as to require separate transportation accommodations.

Those in the litter classification are moved by ambulance. Normally there are four patients to the ambulance. Separate accommodations may be required by the Surgeon where contagious diseases are concerned.

The most economical use of motor transportation requires that consideration be given to the degree of availability that may be expected for each vehicle. Single vehicles may make a number of round trips during an operation thus affording a high availability.

In order to evaluate the availability of vehicles, two factors must be considered: (1) the average rate at which patients are moved from the hospital ship and delivered to the vehicles at the loading point and (2) the average time required for a round trip, including loading and unloading. Turn-around time being constant, it is manifest that the availability of vehicles for repeated use varies in inverse proportion to the rate at which patients are delivered to the loading point.

The rate at which patients are moved from the ship to the loading point on the dock should be measured in time. Rates should be determined at each port because dock facilities and methods of evacuation affect the speed with which the operation is conducted. In the absence of other data, actual practice indicates that the following figures are typical where patients are moved from the hospital ship to the dock over a gangplank: ambulant and troop class, one every six seconds or 0.1 minutes; non-violent mental, one every twelve seconds or 0.2 minutes; violent mental, one every thirty seconds or 0.5 minutes.

The maximum number of patients for which

motor transportation needs must be estimated may be calculated as follows: "t" is the time required for a round trip including time for loading and unloading. The average rate at which the sick and wounded arrive at the loading point is "R," and, for these, "N" is the maximum number for which motor transportation must be estimated. The maximum number of patients for which transportation requirements need be estimated is then determined by use of the following formula:

$$\frac{t}{R} = N$$

For example, the motor transportation needs for troop class and ambulant patients where there is a thirty-minute turn-around may then be calculated:

$$\frac{30}{0.1} = 300$$

In other words, motor transportation facilities must be provided for 300 patients before these facilities become available to additional patients on the ship. A bus passenger capacity of 400 is required to move these 300 patients because it has been determined that about twenty-five percent of the total capacity must be allowed the personal effects of the patients, the attendants, and certain types of injuries.

Similarly, the number of violent mental patients on which ambulance requirements must be estimated where, for example, the round trip time is seventy minutes is calculated:

$$\frac{70}{0.5} = 140$$

At two patients to the ambulance, seventy usable ambulances would be required to maintain unimpeded movement. The number of violent mental patients is limited, however, to the security accommodations of the hospital ship, and in practice has been found to be generally much below the number that can be evacuated from the ship in the usual turn-around time. It is necessary then to compare the figure obtained by formula with the number for which security accommodations are available on the hospital ship concerned or with the number indicated as having been

evacuated on the hospital ship in the cabled report of the overseas commander. A ten percent allowance for dead-lined vehicles, break-downs en route, and the occasional patients requiring separate accommodations is recommended.

The number of non-violent mental patients which is used as a basis for estimating transportation requirements for a twenty-minute round trip operation is:

$$\frac{20}{0.2} = 100$$

The bus passenger capacity must, however, be calculated at two times this number of patients to allow for one attendant to each patient plus the ten percent of the passenger capacity for personal effects, or, in this case, 220. Thus a bus passenger capacity of 220 must be used to move the 100 non-violent mental patients delivered to the loading point before the same buses again become available on the loading line.

The number of litter patients on which motor transportation requirements must be based where the round trip time is forty minutes is determined:

$$\frac{40}{0.5} = 80$$

At four patients to the ambulance, twenty such vehicles must be available to maintain the desired smooth, uninterrupted flow of litter cases from the hospital ship. This number should be increased by ten percent to allow for dead-lined vehicles, break-downs en route, and transportation for patients requiring separate handling such as infrequent cases with contagious diseases. Then it may be calculated that twenty-two ambulances will provide all the motor transportation requirements for the shipside evacuation of litter patients arriving at the loading point at the average rate of one each 0.5 minutes where the turn-around time is known to be forty minutes.

It must also be pointed out that the ambulances that are required for violent patients may be used for litter patients, so, although the needs of both must be considered, only the transportation for the class of patient with

the greatest requirements need be provided. Thus if forty ambulances are found to be required for the movement of litter patients, and twenty for violent mental patients, then the forty required for the litter group will meet the needs of both. This is also true for the classes of sick and wounded being moved by bus. In order to insure that the vehicles used for one class of patient will be available for another class requiring the same type accommodations, the movement of the patients from the ship by class should be in the fol-

lowing order: (1) ambulant and troop class, (2) violent mental, (3) non-violent mental, and (4) litter.

The method of estimating motor transportation requirements described herein may be adapted to advantage by evacuation personnel at ports and possibly other locations. Use of this technique not only provides a basis for accurate estimations of motor transportation needs but tends to establish standards for refinement of evacuation operations.

Abandoning Ship

From *The Bulletin of the U. S. Army Medical Department* May 1944.

THE U. S. Navy has published a booklet, entitled *Survival on Land and Sea*, which contains the main things that a man should know about living in wild countries and wild places. In the section on "Abandoning Ship," it is said that one should wait until the ship comes to a stop, try to get away in a lifeboat, and jump only when it is impossible to go down a hose, line, cargo net, or ladder. Remember to put on your gloves and go down hand-over-hand. Don't slide and burn your hands! You'll need them later. If it is necessary to jump, get rid of your steel helmet first, and then hold your nose and jump as far out as possible, hitting the water with your knees bent, your legs together and pulled up against your stomach.

If you have a cork life jacket, throw it over first and jump after it. Don't wear it when you jump or it may knock you out. If you have a pneumatic rubber jacket and are a good swimmer, jump in before you inflate it and swim as far away from the ship as seems safe before you do. If you are wearing a kapok life jacket, be sure the lower drawstring is drawn tight and tied securely before you jump.

If you have to go overboard, go over the weather or windward side. The reason is that

any wind will drive a drifting ship down on you. Take care not to be washed back aboard if a sea is running. To avoid this, leave the ship by the bow or stern, whichever is lower in the water. If the propellers are still turning, leave by the bow. When beyond dangers, relax and swim or paddle slowly toward the nearest floating object or mass of survivors. It is well to figure out where you want to go in a general way before you go into the water, because you can see much more from a deck than you can when you are swimming.

If fuel oil has been discharged, avoid it as much as you can by keeping head and eyes high and your mouth closed. Swallowing oil will make you sick and, if it gets in your eyes, will inflame them for a few days.

Should you have to jump from the ship into burning oil, you may, if you are a good swimmer, avoid being burned by the following procedure: Jump feet first through the flames. Swim as long as you can under water, then spring above the flames and breathe, taking a breast stroke to push the flames away; then sink and swim under the water again. Men have been able to get through 200 yards of burning oil in this way. To do it, however, you will have to remove your life belt and other cumbersome clothing.

"Finest Fighters, Inc."

LIEUTENANT COLONEL BRAINARD E. PRESCOTT, *Infantry*
Instructor, Command and General Staff School

A CORPORATION having eight hundred employees is, even in these days, a large business. A holding company having sixteen subsidiaries of about that size or a total of over 14,000 employees is a big business in any country in the world. You'd expect, as a stockholder and employee of such a company, that it would have an up-to-date, vigorous personnel manager; and you'll agree, I think, that he would be an important personage in the firm.

What has that got to do with the military service? Just this; the number of people on the payrolls of a battalion equals those of one of our sixteen corporations and the division is certainly in the category of our holding company. As a matter of fact the division is a member of one of the most gigantic and most beneficent trusts in the entire world. If we were going to incorporate we might well call our organization "Finest Fighters, Inc."; to us, however, it is still the Army. The Army as a corporation sees that its employees have all the clothing they need, complete medical care, insurance, pensions, recreation, and entertainment. It doesn't permit strikes, but then again it does everything in its power to see that conditions of dissatisfaction don't exist. The military corporation has for personnel managers, officers known as S-1's for battalions and regiments and G-1's in the divisions.

On entering the office of the personnel manager of a commercial corporation of comparable size you would expect to find a myriad of vivid charts and graphs covering the walls on such matters as absenteeism, accident and sickness rates within departments, total number of employees on the payroll, and vacations. When a directors' meeting was held you'd expect, as a director, to be shown from graphs and charts in a few minutes just what conditions existed, in order that you could gauge the efficiency of the various departments.

Why, then, can't the same type of reports

be made available to any commander within the military? Certainly not because the information isn't available, for we have in our Army the most complete personnel records in the entire world. Is it for lack of space to carry such records or lack of time to make them? Those might be reasons. It is, however, the purpose of this article to show how personnel statistics may be kept in the form of graphs and charts in the field and what information is desirable in that form.

Everyone will agree that a commander needs studied, current information, with respect to personnel, in order that he may be aware of the human capabilities of his unit. With the stress of modern battle as great as it is, that information must be prepared for presentation so that the commander *sees the picture* instantly. Thus our information must be prepared in such a form that it creates an immediate mental picture in the minds of those who peruse it. Graphs and charts will give us this picture.

Our problem then, is to determine what information should be kept in graph form and what type of graph should be used.

First, let us take a fairly obvious and simple example; that of portraying the com-

Unit	T/O Str	Str 5 Apr	Str 6 Apr
1st Armd Inf Bn.....	962	577	527
2d Armd Inf Bn.....	962	662	617
3d Armd Inf Bn.....	962	812	688

FIGURE 1a.

parative strength of units of a division. Figure 1a gives the T/O strength of the three armored infantry battalions of an armored division followed by the strengths reported on two successive days during a campaign. Strength will be reduced in those units daily until such time as the division is furnished replacements.

Now let us think about preparing a graph on which we can chart strength daily during the campaign. Since the type of information

which we are going to keep is cumulative in character, a bar graph such as that shown in Figure 1b will suit our requirements.

The next thing for us to decide is whether or not we are going to make as our yardstick of measurement the actual number of persons within the units of the command or convert our figures to percentages of the particular unit for which a bar is drawn. If we make our graph with actual persons as the measuring stick our graph will be simple to keep, but we will have an inaccurate picture of the comparative strengths of units having different T/O's. That is to say the bar for a unit having a T/O strength of one thousand men would be twice the size of one having only five hundred. Since each unit is a specially designed tool for a certain job we are not interested in comparing its relative size with other units, but rather we are concerned with its combat strength as a special tool designed under a T/O as compared with the relative strength of other units with which it will work under their T/O's.

A graph which utilizes percentages as the unit of measurement will give us the desired relationship. Therefore, we will make the T/O strength of each unit equal 100 percent on the graph. By so doing we can take the group of units that make up a combat command and by simple mental arithmetic quickly state its effective strength.

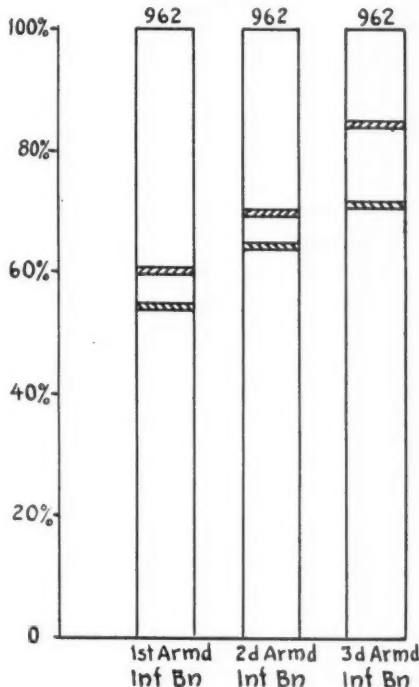
Figure 1b shows the strengths reported in Figure 1a converted into a bar graph. Note that as the units shrink in size through normal attrition and through battle casualties, that fact is recorded simply by cutting down the size of the bar. This is a very simple matter to do each day as the strength report is received.

In addition to giving us a quick, accurate picture of effective strength, our graph will be of value when it comes time to distribute replacements amongst the units. This will be particularly important in situations where sufficient replacements will not be received to fill all units to T/O strength, which is the usual situation.

For example, we can tell at a glance what the result will be if we decide to fill up one

unit in preference to others. We can tell quickly what the ratio of old men to new will be, what the resulting strength of other

1ST ARMD DIV STRENGTH CHART 5 & 6 April



Apr 5
" 6

950

FIGURE 1b.

units will be. Thus we can work to a desired result by the use of the graph.

Figure 1c illustrates the distribution of 600 replacements within the three battalions in proportion to their losses.

Thus if we keep this type of graph we can show the commander the percentage combat effectiveness of his unit or of any given combination of units without hesitation and in a

manner which will etch any weaknesses in man power upon his mind.

Another type of information which the commander needs is the casualty rates as

the limit of its physical endurance can be seen.

CASUALTY REPORTS

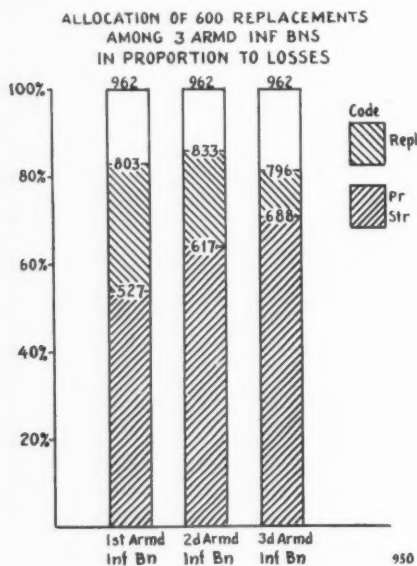


FIGURE 1c.

they occur. He will further desire to compare the different types of losses, such as wounded, killed in action, exhaustion, sick and missing, both for the entire command and also as between units.

In charting this type of information a different form of graph will be used. Such a graph should not only cover a period of time but it also should make it possible for a comparison to be made between the losses on different days. In other words it should measure the frequency of the occurrence and depict trends.

When we measure frequency, a curve is the best type of graph to use. Upon looking at it we are able to compare instantly the number of wounded or those reporting to medical stations in an exhausted state, comparing today's battle with those of yesterday. Thus the trend of the division toward

	Killed	Wounded	Disease & Injury	Exhaustion	Missing
7 July	28	104	54	2	95
8 July	4	26	46	3	80
9 July	6	54	66	4	32
10 July	9	51	86	4	10
11 July	12	78	114	6	40
12 July	9	62	128	17	5
13 July	7	41	154	32	62
14 July	30	19	246	48	74
TOTAL	105	435	894	116	304

FIGURE 2a.

Figure 2a gives the loss figures for one unit during several days of continuous battle. In that form it requires a great deal of analysis before it means anything to the reader.

Figure 2b illustrates the same information presented in a curve graph form. From it one can immediately obtain an estimate of future losses and also note certain trends. Remember that this particular graph is not cumulative in character. That is, it only measures losses for the particular day. In such a graph correction must be made for errors in previous days' figures. For example, note how the curve on persons reported missing has been corrected on 9, 10, and 12 July. The necessity for this correction arose because during the heat of battle many men became lost from their units and were reported as missing. On subsequent days they found their units or were returned by the Military Police. If the correction is not made, then the graph will show a more alarming condition of disorganization than actually exists. Thus in charting the curve it was necessary to go below the horizontal line in order to correct the previous days' figures.

If such a graph were kept for each major combat unit within a particular organization a comparison of the graphs would show at a glance which unit was losing the most men through exhaustion or straggling and which was in the greatest need of relief. In addition, with a background as to the in-

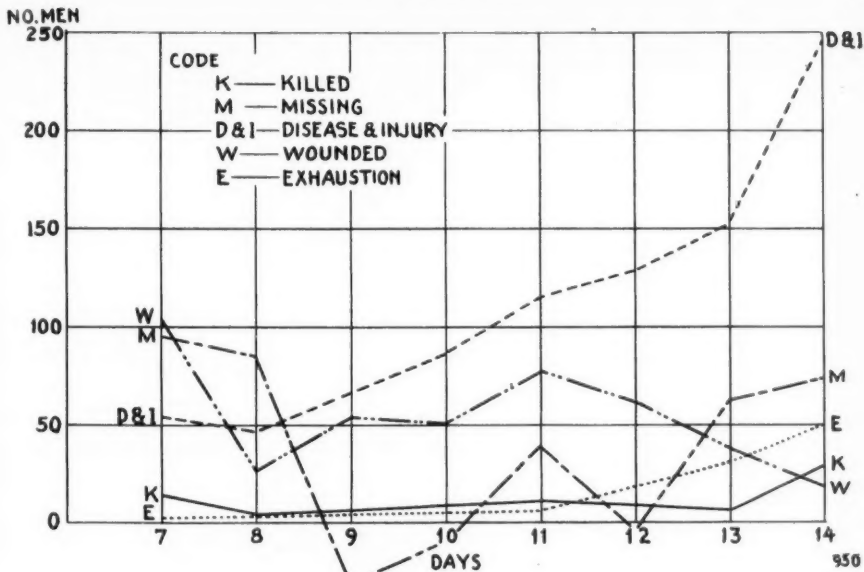


FIGURE 2b.

tensity of the fighting, and the terrain conditions, the commander would have a visual picture of the results of training, the discipline and leadership being exhibited by his commanders, the degree of control or lack of control being exercised, and the effectiveness of sanitary measures.

It is all very well, you say, to sit behind a desk and talk about making graphs but the question that we want answered is how we can keep such charts without overburdening ourselves with a lot of additional records and paraphernalia in the field. The answer to that question is that one basic graph sheet for all units and overlays for each type of report that is susceptible of graphing is all that is necessary.

A further example will illustrate the method of keeping such graphs and also will stress the possibilities of the use of graphs and overlays in obtaining a quick overall picture of conditions within a particular unit. This is possible even with different types of reports received from totally unrelated sources.

For an example, let us assume that the 101st Division has been fighting in Italy and has been relieved from combat and sent back to an area in which the town of Cervano is located. The 403d Infantry is billeted in the town, while the 404th Infantry is bivouacked in a tent camp about ten miles outside of the town.

The G-1 of the division receives reports daily from the various special staff officers on the matters within their particular province. For example, the Surgeon reports on all sickness including venereal and endemic diseases. The Provost Marshal makes his report showing the number of soldiers arrested. The Adjutant General furnishes the strength report. These reports are shown in chart form in Figure 3a. Received individually and with no means of comparison these reports give us only a partial picture of what is happening within the division.

However, let us assume that the G-1 of the 101st Division has a system of keeping all such information. He has a basic graph the vertical line of which measures percentages,

while the horizontal line represents days. He also has a series of overlays fitting this graph. When reports are received on units, the G-1 has his clerk or stenographer convert the figures to percentage and then extends the overlay on that particular item to cover the day on which the report is made.

Thus if the G-1 wants to compare the percentage of noneffectives between the two regiments he merely places the one graph over the other. Not only is he able to com-

pare the rates of the two regiments, but he also is able to perceive any trends within the division as a whole.

Figure 3b is a consolidated graph with the information from the Provost Marshal and the Surgeon's Venereal Report as charted in Figure 3a placed on it. It represents a basic graph with two overlays superimposed.

If you want to complete the graph, put the information from the AG report on noneffectives on an overlay and place it on the printed graph.

If you will take time to study the graph with the overlay you will note that the 403d Infantry which was billeted in Cervano has a steadily increasing incidence of VD. You will also note that the Provost Marshal's report indicates a greater number of arrests within the same unit. Disciplinary cases are, however, increasing slightly in the 404th Infantry.

Next let us examine more fully the Surgeon's report on VD. When the units came out of combat no cases were reported. However, on the 16th, two cases occurred in the 403d. Probably these were men in the advance party. Six days after the arrival of the unit in Cervano many cases were reported and the trend is alarmingly upward. The rate in the 404th initially was negligible but it has increased lately, possibly for the same reason that disciplinary cases are being reported; the men are going into Cervano.

It is entirely self-evident from the graph that conditions within the Cervano area leave much to be desired. Sanitary conditions are poor, conduct is unmilitary, probably due to the availability of wine, and the men are coming in contact with women suffering from venereal infection.

Thus our graph has indicated rising trends to us in two different fields, and if we chart the report on noneffectives we will have a third. After further investigation the G-1 is in a position to go to the Division Commander with a graphic presentation of conditions, perhaps in color, to indicate each unit. On this basis he can make positive recommendations with reference to moving the

DAILY STRENGTH REPORT (NUMBER OF NON-EFFECTIVES)

Oct	403d Inf	404th Inf
13 -----	30	35
14 -----	40	34
15 -----	50	32
16 -----	55	30
17 -----	60	35
18 -----	65	37
19 -----	120	40
20 -----	150	40

PROVOST MARSHAL'S REPORT DISCIPLINARY CASES

Oct	403d Inf	404th Inf
13 -----	5	0
14 -----	50	5
15 -----	40	15
16 -----	75	20
17 -----	80	20
18 -----	45	25
19 -----	60	20
20 -----	75	35

SURGEON'S REPORT, VENEREAL DISEASE (NEW CASES REPORTED)

Oct	403d Inf	404th Inf
13 -----	0	0
14 -----	0	0
15 -----	0	1
16 -----	2	1
17 -----	0	0
18 -----	30	15
19 -----	90	10
20 -----	120	10

FIGURE 3a.

VENEREAL AND DISCIPLINARY CASES IN TWO INF REGTS

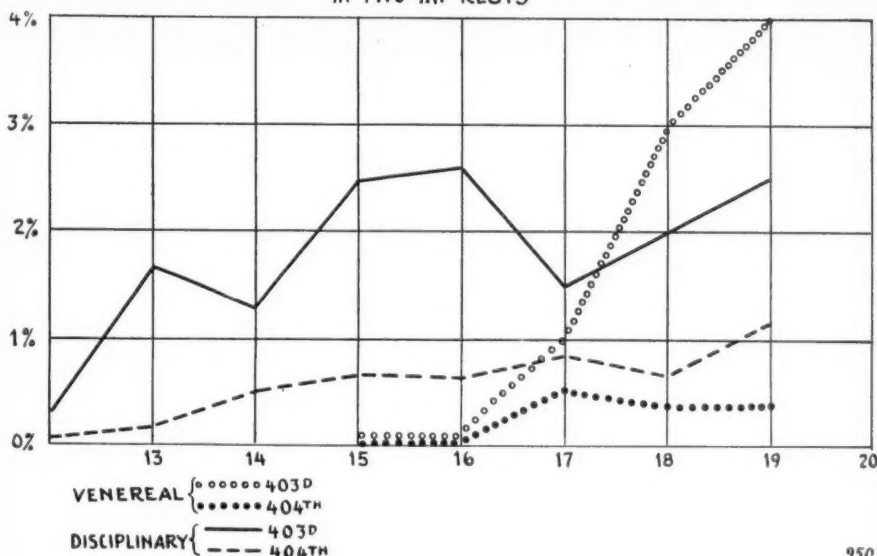


FIGURE 3b.

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403d out of the area and declaring Cervano off limits.

Having become graphic conscious, you will find that in every phase of staff work, whether it be in the combat zone or in the communications zone, graphs will help you to appraise conditions within your organization. All staffs are responsible for keeping their commanders informed. To the staff is given the responsibility of studying the efficiency

of the various organizations making up the command. Graphs are a means of giving a quick picture and afford a basis for visual analysis of morale, discipline, efficiency, and state of training. The old Chinese proverb, "A picture is worth ten thousand words," is applicable to the reports of "Finest Fighters, Inc.," just as much as to any commercial enterprise.

One of the finest qualities in man is described by the simple word "guts"—the ability to take it. If you have the discipline to keep going when your body calls for rest, if you have the discipline to stand when your body wants to run away, if you can keep control of your temper and remain cheerful in face of monotony or disappointment, you have got "guts" and can take it.

—"Onlooker" in *The Journal of the Royal Artillery* (Great Britain).

Casualty Reporting

COLONEL GEORGE F. HERBERT, *Adjutant General's Department*
Chief, Casualty Branch, Adjutant General's Office

This is a discussion of the problems of record-keeping and office management which had to be solved in order that news of casualties, upon receipt in Washington, D. C., could be quickly communicated to those concerned.—THE AUTHOR.

THE Casualty Branch is that part of The Adjutant General's Office to which all reports are sent concerning overseas casualties among military personnel, and all other persons accompanying or serving with the Army outside the continental limits of the United States. Notifications regarding personnel who become casualties while within the continental limits are handled by the nine Service Command Headquarters.

Prior to October 1942, these reports from overseas were handled in three separate branches of the A.G.O. which deal, respectively, with the affairs of commissioned and warrant officers, enlisted personnel, and civilian employees of the War Department, but the increase in this work, necessitated by the far-flung operations of the United States Army in this global war, made it desirable to set up one central agency to which all reports of casualties occurring among all personnel making up our overseas armies could be sent.

The first duty of this Branch is to telegraph the news to the "emergency addressee," the person designated by the soldier as the one to be notified in case of emergency. This is not necessarily the next of kin. Each person departing from the U. S. A. is required to sign an "Emergency Addressee Card," listing the person to be notified in case the soldier becomes a battle casualty, is injured accidentally, or becomes seriously ill. Requests from close relatives that they, too, be notified in case of emergency are filed with these W.D., A.G.O. Forms 43, and the required additional telegrams are sent if the individual concerned becomes a casualty. At present all reports concerning casualties are consolidated

at the various theater headquarters, and transmitted to the War Department by radiogram or cable. Information from enemy governments concerning prisoners of war is received through the International Red Cross, and is cabled from Geneva.

Upon receipt in the Casualty Branch, these cables and radiograms are broken down into individual "Casualty Reports," which are prepared on continuous six-part fanfold forms, which are then sent through the Record Section where the W.D., A.G.O. Forms 43 (Emergency Addressee Cards) are associated with the Casualty Reports. It is in this Section that any reports which cannot be associated with a Form 43 are turned over to an Identification Unit, whose job it is to search other War Department records (files of serial numbers, rosters, Enlistment and Induction Records, etc.) in order that there can be no doubt as to the person referred to in the casualty report, since obviously the War Department must be absolutely certain of the identity of each person listed as a casualty before passing the information on to the emergency addressee and other Government agencies concerned.

Information contained in the reports received in Washington may have become garbled in transmission, and the name or serial number shown on the Casualty Report may not check completely with the Form 43 of any individual on file. It is these reports that the Identification Unit must check against the other records on file in the War Department before further action can be taken. In the rare instances where all search proves unavailing, a message is sent to the field asking for a check on the unintelligible portion of the message. From Record Section the Casualty Reports and associated records are sent to Notification Section for preparation of telegrams to the emergency addressees, and copies of the Casualty Report are distributed to Enlisted or Officers' Branch of the A.G.O.; Machine Records Branch,

A.G.O. (for use in preparation of statistical reports); one copy is held in Casualty Branch file folder (in case inquiry is received concerning the individual during the interval his records are being acted upon); and one copy is turned over to the control clerks whose duty it is to make sure that telegraphic notifications are made for each report which passes through Record Section. The sixth copy of the Casualty Report is sent to the individual's AG 201 file with a copy of the telegram dispatched by the Notification Section.

These telegrams are prepared on continuous fanfold forms, and vary from six to ten parts, depending upon the classification into which the casualty falls. By means of copies of these telegrams, all other interested Government agencies are informed of the latest status of each person reported as a casualty.

In the case of personnel reported wounded or seriously ill, the telegram is followed by a letter promising "progress reports" at fifteen-day intervals and inviting the sending of five-word "Messages of Cheer." Great ingenuity is displayed in the composition of these necessarily brief messages, which are consolidated and radioed to each theater for delivery to the individuals to whom addressed.

A system of follow-up letters is now being installed which will include the latest APO address to which personal mail for hospitalized personnel should be sent.

In the case of each person reported missing or missing in action, a follow-up letter is sent giving any additional details not included in the telegram, and this is now being followed by additional letters at ninety-day intervals, provided no other details have been communicated to the War Department in the interim.

Telegrams reporting deaths are followed by letters of condolence, accompanied by information regarding benefits, and these cases are then acted upon by the Certification Section, which closes out the War Department records, transmitting them to the World War II Records Branch at High Point, N. C., and

issuing a "Report of Death" in each case. These are prepared on ten-part continuous fanfold forms, and copies are dispatched to the following government agencies:

Veterans Administration (which handles pensions of dependents and pays beneficiaries of Government and National Service Life Insurance).

General Accounting Office (arrear of pay).

Quartermaster General (who is concerned with all matters pertaining to Graves Registration).

Army Effects Bureau (returns personal effects of deceased personnel).

The Surgeon General (Army nurses only).

F.B.I. (as a matter of record).

Finance Officer, U. S. Army (pays six months' gratuity).

Chief of Finance (in connection with arrears of pay).

This Section also issues certificates of death to insurance and trust companies which request them.

A person reported missing is carried in that status until a determination by the theater commander concerned is received that he has been presumed dead, or until the expiration of twelve months, at which latter time each such case is reviewed by the Status Review and Determination Section. The majority of the officers assigned to this Section has had legal training and these lawyers review these cases under the provisions of Public Law 490 (77th Congress) as amended, which provides that the Secretary of War shall make this review at the end of twelve months from the date the individual was reported to be missing, and, according to the facts and circumstances in each case, make a finding of death or continue the missing status.

The Secretary of War has delegated this authority to the Chief of the Casualty Branch, and he must personally sign all such "Findings of Death" or determinations to continue the individual in a missing status

if the circumstances warrant a presumption that he may still be alive.

All other interested agencies are provided with copies of the action taken at the end of twelve months by the Chief of the Casualty Branch, under Public Law 490.

After the initial notification has been sent by the Casualty Branch, all matters regarding our troops who are prisoners of war are handled by the Prisoner of War Information Bureau of the Provost Marshal General's Office.

As a result of requests received from some camps, asking for information on various subjects of vital interest to those who are unable to attend personally to their affairs for "the duration," a comprehensive bulletin of information was recently prepared for distribution to all prisoner of war camps where Americans are held or detained. This bulletin covers such matters as pay and allowances due from our Government; use of wages paid by the detaining power; allotments for all purposes, including purchase of bonds and safekeeping thereof; family allowances; Government insurance; payments of premiums on commercial insurance; the benefits provided by the Soldiers' and Sailors' Civil Relief Act; taxes; power-of-attorney; policy regarding promotion; and information regarding channels for official communications.

This bulletin will be kept up-to-date, and revised editions issued as required.

Inquiries concerning casualties, both those which have been reported officially and those which are based upon rumors, are received in large numbers by mail, telegraph, and telephone.

The Correspondence Section answers all such written requests for information, and a special unit handles telephone inquiries, making note of the request and calling back the same day. These latter average 400 per day.

All personal mail (letter and parcel post) returned to sender because the addressee was listed as "killed in action," "missing in action," or "died of wounds," was formerly routed through the Casualty Branch for a final check before being sent back to the

originator, to insure that all notations appearing on such mail coincided with War Department records. This work is now being performed at the various theater headquarters, so one small task which occasionally assumed larger dimensions is now being gradually eliminated from the long list which this Branch performs.

One of these is the keeping of wills. Any person in the Army may deposit a will with The Adjutant General to be sent to a specified address in case death ensues. These are kept in a vault, and so far their volume presents no problem.

The big problem in handling the work of this Branch is the fact that the casualty messages do not arrive in an even flow and, obviously, nothing can be done to change this fact. It is also obviously impossible to maintain an organization which will be big enough to handle any foreseeable work load expeditiously and then have it sit around and wait for another "peak load." This problem has been tackled by shifting personnel throughout the Branch, following the work through the different sections. Thus, a fanfold machine operator, having produced Casualty Reports from radiograms or cables, will be shifted to another fanfold machine to write telegrams and then to still another such machine in the Certification Section to produce "Reports of Death."

The same problem of "peak loads" appears when thousands of Forms 43 are received following the arrival of a large convoy of troops in, say, England or some other foreign theater. These must be quickly filed, and all available personnel is detailed to this task until the backlog is eliminated.

Procedures in use are being constantly surveyed with a view to speeding up the work, consistent with the paramount consideration that accuracy comes before everything else.

A system of Battle Casualty Reporting which has as its basis the use of a punched Machine Records card known as a "Theater Casualty Card," which will be produced by Mobile Machine Records Units and reproduced to provide as many additional copies as may be needed in any given theater, is now

being adopted, and this will eliminate most of the difficulty presented by garbled cables and radiograms containing errors traceable to manual operations. If successful, this system will also be extended to cover non-battle casualties and progress reports concerning hospitalized personnel.

The Branch, since its organization, has worked a two-shift day, the day force being much larger than the force which works until midnight.

Should the exigencies of war require, the Branch, by obtaining additional personnel, can extend its present output considerably without any additional equipment by adding a third shift and working around-the-clock.

Much is being written in the papers these days about the predictions of heavy casualties to follow the impending cross-channel in-

vasion, these dire predictions being attributed to "high Government officials." The matter of casualties which do occur will be influenced by many at-present-unknown factors, such as the thoroughness of the aerial preparation against the hostile coast, the strength of enemy defense, his will-to-resist, and, of course, the size of our assault forces.

Whatever should be our good or bad fortune in this matter of casualties sustained, the Casualty Branch has laid plans for keeping its work current by obtaining additional personnel and equipment, if needed, and by using its present personnel and equipment to the limit, in order that all the news concerning casualties, be it good or bad, may be speedily communicated to those who are vitally interested in the fortunes of war as they pertain to their kinfolk.

The Influence of English on the Japanese Language

IN "Nihongo—The Japanese Language" appearing in *The Atlantic Monthly* for May 1944, Bruce Lancaster states that from the standpoint of language Japan has borrowed enormously and has lent almost nothing. He says further that Japanese has, of course, borrowed much from the Chinese language and that some words are traceable to Portuguese and Spanish. The Dutch "who were in Japan from 1601 down to our day, seem to have left no trace on the language. Nor did the first English, whose stay was brief."

When Japan was reopened, the article continues, the country was swept by a deluge of Western words which were mostly British and American in origin and which were incorporated into the tongue as everyday Japanese words, frequently expressed with a special ideograph.

As for pronunciation, Mr. Lancaster indicates that in general all syllables are uniformly accented and that with few excep-

tions when a word is written in *Romaji* (our script) each letter is pronounced.

Among the examples of "borrowed" words mentioned in the article, and some additional ones which have been taken from TM 30-275, Japanese Phrase Book, may be found *kiyande*, candy; *tabako*, tobacco; *burashi*, brush; *inki*, ink; *matchi*, match; *pin*, pin; *paipu*, pipe; *naifu*, knife; *aisu-kurimu*, ice cream; *bata*, butter; *hankechi*, handkerchief; *poketo*, pocket; *renkoto*, raincoat; *taiya*, tire; *bureiki*, brake; *kabureta*, carburetor; and *pomp*, pump.

Absent from Japanese are all "f" sounds except "fu." Consequently, a word like "coffee" taken over into the language becomes *kohi* as some other letter sound is substituted. Mr. Lancaster points out that as Chinese lacks the "r" sound, so Japanese lacks "l." Thus such English words as "jelly" and "gasoline" become *jeri* and *gasorin* in Japanese.

"Comin' 'Round the Mount'in" -- With Class III Supply

LIEUTENANT COLONEL THOMAS S. KITTRELL, *Quartermaster Corps*
Instructor, Command and General Staff School

NOTE: This story is based on actual observation, but the names of places and persons and units are not the actual names and designations.—THE AUTHOR.

1. GENERAL SITUATION.—*a.* XYZ Corps was operating as an independent corps. Army headquarters was expected to move in and take over within the next week. Meanwhile, XYZ Corps, as the highest echelon of ground command present, was performing both corps and army administrative functions. Plans had been made for an attack east of Blank Mountain, but at the last moment were changed and an attack west of Blank Mountain was ordered.

2. SPECIAL SITUATION.—*a.* Map.—Sketch map herewith.

b. Early on 14 October the corps attacked west of Blank Mountain, the 401st Infantry Division (which according to the original attack plans was designated as the corps reserve) making the main effort. It met with unexpected success initially, advanced rapidly, and by 1730, 14 October, the situation was as shown on sketch map herewith.

c. Administrative Situation.—The Corps G-4, who had prepared excellent plans to support the planned attack east of Blank Mountain, with alternate plans to support all prepared alternate tactical plans at that time, found that this sudden and unexpected change of tactics not only fooled the enemy but caught him with all his supply installations set to support the attack east of Blank Mountain. The rapid advance of the division making the main effort further complicated the supply situation. To add to his troubles the corps command post displaced forward early in the afternoon, and at this time was just setting up in the position shown on the sketch map. The G-4 was out on reconnaissance, and Captain "A," the newest assistant G-4, complete with map roller, was studying the administrative map. The field

phone rang, and Captain "A" picked it up.

"Wagonwheel—Quart [code of the day for XYZ Corps G-4] 7-Y," he said.

"Greywolf [code for 401st Infantry Division] 3-T," came back over the wire.

"Go ahead, Greywolf."

"How about a new Class III supply point for this division? We have run away from No. 43, and traffic back there is terrible."

"Do you have a recommendation?"

"Yes, I have picked a spot on the west side of Bottle road, exactly 6.4 miles north of RJ Bottle Road—Route 13."

"Hold it a minute." Captain "A" located the spot on the map, ran his map roller rapidly over the route from Class III Supply Point No. 43 to the proposed new location and did some rapid mental logistical computations:

Distance 15 miles, travel	
time (night)	1½ hrs
Load up trucks ready to move--	½ hr
Reconnaissance of new	
location	½ hr
Issue orders	¼ hr
Unload and set up new	
supply point	½ hr
Total time	3¼ hrs

"It is now 1745; in three and a quarter hours it will be 2100—better add a safety factor, say of one hour; that makes 2200. In all the problems we used to have at Leavenworth they used to say it took twelve hours to move a supply point, but I never agreed with that figure; they just put that in to make it harder. I will just prove that they were wrong."

Captain "A" picked up the phone again: "Greywolf—sure, we will put you in a Class III supply point at the place you want. Mark it on your map now: No. 47, opens 2200, 14 October."

"That's fine, Wagonwheel, thanks; we will begin drawing at 2200," came back over the phone, and Captain "A" rang off.

3. REQUIREMENT.—The actual orders is-

sued and actions taken by all concerned to open Class III Supply Point No. 47 as promised by Captain "A."

4. THE SOLUTION (Not "A" SOLUTION).— Captain "A" did the following:

(1) Placed symbol on map as shown on sketch map (CI III SP No. 47).

(2) Called in Captain "Q" (a quartermaster officer who was acting as liaison officer at corps headquarters), acquainted him with the situation, and directed him to send a message to the officer in charge of Class III Supply Point No. 43, directing him to move immediately to the new location selected and open Class III Supply Point No. 47 at 2200, 14 October.

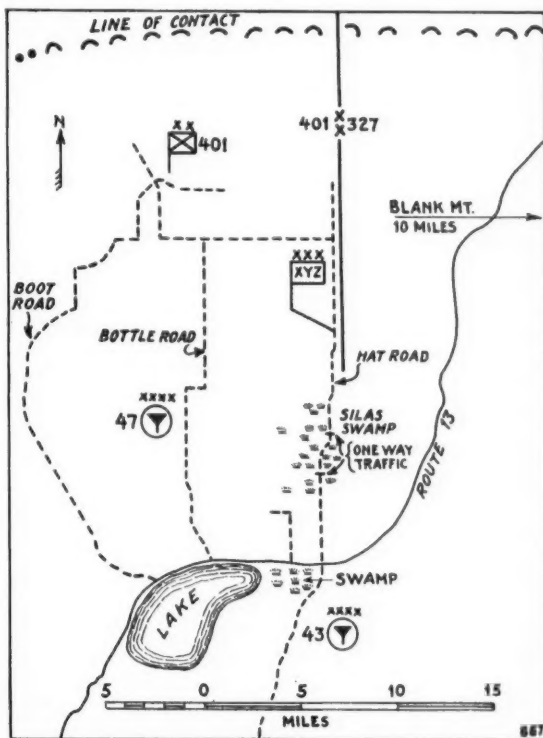
(3) Upon being reminded by Captain "Q" that the command post had just moved and no wire connection was in with Supply Point No. 43, he directed Captain "Q" to deliver the message personally to Class III Supply Point No. 43, and see that it was moved to the new location.

"It is fifteen miles from here to No. 43," said Captain "A," "and will take you one and a half hours to get there, but that still leaves about two and a half hours to get it moved, so stay with them and push it."

Captain "Q" did the following:

(1) Left the corps CP at 1800, via Hat Road. When he reached Silas Swamp he found that the road was in bad shape, and some engineer troops were constructing a causeway. One-way traffic was necessary and it all seemed to be moving north. No military police were in evidence, and the one-way traffic was taking its natural course with no breaks to permit south-bound traffic to proceed. A delay of thirty minutes was enforced here, waiting for a chance to get through, and as a result Captain "Q" ar-

rived at Supply Point No. 43 at 2000 instead of 1930 as expected. Here he found that Lieutenant "G," commanding the gasoline supply platoon operating this supply point, had gone on reconnaissance for a new location, having been so directed by the Corps G-4. He also found that corps artillery (part of which had blocked his southward passage over Silas Swamp) had just made a heavy run on the supply point, and the bulk of the gasoline cans



had been sent back to the nearest Class III depot for refills. The sergeant in charge reported only 1600 gallons on hand, and estimated that the trucks from the depot would arrive at 2300.

(2) Captain "Q" then decided to make a personal reconnaissance of the route to pro-

posed location of Class III Supply Point No. 47, estimating that he could make the reconnaissance and return to location 43 by the time the trucks returned with the bulk of the gasoline. He instructed the sergeant to have everything in readiness for a move on his return, and taking a small detail from the gasoline supply platoon with him, started north, and upon reaching Route 13, turned west. Since it was extremely dark and cold, curtains were up, but a close lookout was kept for Bottle Road. Expecting a traffic control post, or at least a guide, at the road junction with Route 13, Captain "Q" neglected to check his speedometer readings, and so continued on until he saw an MP in the road. He found to his disgust that he was at intersection of Boot Road, and had to turn around and go back. The MP told him that Bottle Road was five miles back. He checked his speedometer, and not finding any road after going five miles, continued a short distance and turned north on the first road he saw. This was a dead-end road at Silas Swamp. Retracing his route, he finally found Bottle Road. The sign had initially been placed too close to the road and knocked down. No MP or guide was on duty there. After that he had no difficulty in finding the proposed location, but as a result of traveling some seventeen extra miles and stopping to decide what to do next, he had lost two hours of valuable time, and did not get back to Supply Point No. 43 until 0100, 15 October. Here he found everything in readiness for the movement, posted his own guides at critical road junctions, moved into the new location (Supply Point No. 47) by 0330, and had the supply point ready to begin issuing by 0400 (having been delayed an

hour by another artillery movement on Route 13), or only ten and a half hours after the request was made. Fortunately no great harm was done, since the G-4 and the QM of the 401st Infantry Division were "old hands" and did not really expect the new supply point to open before about 0500.

From a review of the foregoing narrative, it is easy to see how, in each case, violation of old and well tried principles leads to difficulty.

1. Captain "A" had an opinion, untried by experience, but based on his own "paper" calculations. He also had a guiding principle, based on actual experience of others. When he decided, for no good reason, to discard the lessons learned from actual experience in favor of his own personal opinion, he only succeeded in causing more trouble.

2. The second error occurred when Captain "Q" took it for granted that roads would be marked, and Military Police would be on hand to direct him on his reconnaissance. He should have planned his reconnaissance in advance and made a careful check of his speedometer at each road junction.

3. The third error occurred when both Captain "A" and Captain "Q" failed to consider traffic difficulties, and the extreme difficulty of controlling traffic in a rapidly moving situation.

LESSONS

1. In estimating time and space, plan conditions "*as is*" on the ground, and not "*as you like it*" on a map.

2. Lack of traffic control can and will upset "*the best laid plans.*"

3. When on reconnaissance, don't expect someone else to show you the way.

Your enemy is tough, resourceful, and battle-wise; your duty to yourself, to your men, and to your country is to be tougher, more resourceful, and better trained than that enemy in every phase of battle activity.

—General Eisenhower

The Antiaircraft Officer

MAJOR ROLAND W. BOUGHTON, JR., *Coast Artillery Corps*
Instructor, Command and General Staff School

ANTIAIRCRAFT artillery is not organic to larger ground force units; hence to both commanders and staffs it is often a strange animal. They know that it is supposed to shoot at airplanes, but they do not know how to turn its special capabilities to their own needs. Any military force is a team made up of parts, each of which has a role to fill in the combined effort. No such larger unit can hope to fight effectively if the staff of its commander cannot plan for the full utilization of the special capabilities of its component parts.

The key to success in proper use of antiaircraft artillery is for this staff to make full use of the services and special training of the antiaircraft officer. However, in most cases the antiaircraft officer will not be a permanent member of the staff; he appears only sporadically when his unit is in attachment to the larger force. Hence he will not be a familiar personality with whom the other staff officers are accustomed to working. It becomes doubly important, therefore, that the others make every attempt to gain full use of his services. However, there must be a reciprocal relationship—a trading of help and advice. Therefore each staff officer should ask himself two questions: "What can I do for him?" and "What can he do for me?" A staff is worth its salt only when it effectively relieves its commander of the innumerable details involved in the latter's exercise of command. To do this the staff must work as a *highly coordinated team*. Only when they do this will the antiaircraft officer be able to perform his duties properly and will the command as a whole receive the full benefit of attached antiaircraft artillery.

Training literature does not take up in detail the antiaircraft officer's staff duties and relationships. The purpose of this article is to fill this gap by discussing these matters in detail, to the end that the antiaircraft officer may not remain the forgotten man of the staff. The infantry division, a typical

example of all such large units, will be used as a basis for this discussion.

THE COMMANDER

With respect to his commander, the antiaircraft officer is an expert on the employment of a special arm. The commander may not know much about the use of this new and relatively unfamiliar arm except in a general way. If so, the antiaircraft officer can complete his education in that respect. He can tell his commander just what the attached unit or units can or cannot do. He can clear up any misconceptions the commander may have on the use of this arm. In particular situations, the antiaircraft officer can help his commander reach a decision as to how the antiaircraft artillery can best fit into the overall plan. Based on his relatively thorough knowledge of the enemy air situation, capabilities, and current tactics, he can give his commander an estimate of the enemy air situation which will often be of distinct value in completing the latter's overall estimate. He can state whether or not the present attachments of antiaircraft artillery can provide effective defense for the troops and installations of the unit. If his answer to this question is "No," he can tell the commander the amount and type of additional antiaircraft artillery means which should be requested from higher headquarters. From his knowledge of the enemy air situation and current tactics, he can give expert advice on what troops and installations of the supported force offer the most remunerative targets to enemy air attack. From detailed studies of current trends in selection of objectives by enemy air forces he can make an educated guess as to what installations within the unit are more likely to be attacked. This will be valuable in making a final decision on priorities in case the commander has a hard time deciding on the relative importance of two or more objectives. The antiaircraft officer, knowing whether or not he can exert effective centralized control over antiaircraft artillery units during an

operation, can and should make recommendations as to what attachments, if any, should be made to other subordinate commanders.

One very important matter in the relationship between an antiaircraft officer and his commander is the nature and type of instructions given to the former as commander of antiaircraft artillery troops. Since no larger unit ever has enough antiaircraft artillery to provide effective defense for *all* troops and installations, it follows that some selection must always be made. This *decision as to priorities*, although perhaps preceded by recommendations from the antiaircraft officer, is always the prerogative of the higher commander; he is the one who is finally responsible for the security of his entire force. The actual utilization of the available antiaircraft artillery means, however, is best accomplished by the antiaircraft officer. He is the expert in this matter. Therefore, the higher commander should tell the antiaircraft officer *what* to protect, but not *how* to protect it. In other words, orders to the antiaircraft officer as a subordinate commander should always include a statement of *priorities* for antiaircraft defense. Except for this element, however, such orders should give the subordinate as free a hand as possible in carrying out his mission except for necessary restrictions to insure coordination of effort. The normal type of order to antiaircraft artillery units states only the priorities for antiaircraft defense.

There is one other important matter in the relationship of an antiaircraft officer to his commander—the assignment of ground fire as a primary mission. Antiaircraft artillery possesses great capabilities for use in several auxiliary roles, including fire against tanks, fire on pillboxes or other fortifications, or firing as field artillery. But the provocation should be very great before antiaircraft artillery is shifted to ground fire as a primary mission. It is designed basically for a very special job of bringing down aircraft. Normally it should not be otherwise used unless the air threat has ceased to exist, or unless some ground fire role assumes greater importance and the commander has exhausted other normal means. Should this problem arise, the

antiaircraft officer can be of great help to his commander in solving it. Changing antiaircraft artillery to its auxiliary role as a primary mission must of course be a *command decision*. The antiaircraft officer can advise his commander on whether or not it is worth the risk to forego defense against the air threat. If the latter decides to use antiaircraft artillery in terrestrial fire, his assistant can give him expert advice on how to get the best use out of it.

G-3

The relationship of the antiaircraft officer to G-3 coincides in many matters with his relationship to the commander himself. As G-3 implements his commander's decision by preparing detailed tactical plans and orders, he can obtain much help and advice on the tactical employment of a relatively unfamiliar arm. Conversely, the antiaircraft officer can do much to prevent the misuse of antiaircraft artillery in any such developed tactical plan or order. G-3 should insist that the antiaircraft officer maintain constant liaison with him. As G-3 develops his tactical plans abreast of and ahead of the situation, the antiaircraft officer should keep pace with recommendations for employment of the antiaircraft artillery in such plans. Only through such close and continuous relations can full and continuous defense against the air threat be maintained. Hence the antiaircraft officer should establish his command post in the immediate vicinity of that of the higher unit. He must spend a large part of his time in the tents of the general staff, particularly that of G-3. Direct command and supervision of the antiaircraft artillery units should be accomplished by the antiaircraft officer in between times or passed on by him to his executive. The key to successful and effective use of antiaircraft artillery is the avoidance of "compartmentation" in staff work; the antiaircraft officer must be both *mentally* and *physically* adjacent to the other staff sections of the higher unit.

One specific matter in which G-3 and the antiaircraft officer are particularly concerned is the coordination of all active and passive means of air defense for the larger unit. Here

G-3 can call upon the anti-aircraft officer as an expert to develop and coordinate this very important *Antiaircraft Defense Plan*. It includes instructions not only on active defense provided by anti-aircraft artillery, but also on active and passive defense instructions to all troops of the larger unit. These measures include: instructions from higher headquarters (including restrictions of fire and recognition procedures) on air-anti-aircraft coordination; rules on firing at enemy aircraft by small arms and other weapons; restrictions of fire and recognition procedures for protection of friendly aircraft; special measures of camouflage, concealment, and dispersion as necessitated by the current air situation; instructions on defense against airborne attack; and special secrecy measures to avoid detection from the air and reduce casualties. The bulk of such a plan will be SOP; parts of it will include special or temporary instructions necessitated by the current situation. The anti-aircraft officer has special training and means available to develop this plan in detail. He can also be of great value in special training of troops and in supervising the execution of the plan when it has been approved and is in effect.

With respect to G-3's general planning on tactical matters, it is necessary that the anti-aircraft officer furnish certain tactical and logistical data concerning his unit. G-3 knows a lot about the organic units of the force, but he may be unfamiliar with the characteristics of anti-aircraft artillery units. The anti-aircraft officer can furnish him information such as:

1. Capabilities—the number and size of areas which can be protected, the nature and extent of protection which can be provided for both stationary and moving units, conditions in which effectiveness of defense is cut down or eliminated;

2. Road priorities necessary to permit anti-aircraft artillery to furnish protection during movements;

3. Rates of march and time-lengths of column for anti-aircraft artillery units;

4. Number and types of vehicles in units;

5. Number of vehicles available for other uses, and conditions under which these vehicles can be spared; and

6. Attachments if any of anti-aircraft artillery to other units in specific situations.

G-3 can also call upon the anti-aircraft officer to prepare the subparagraph of field orders which contains missions and instructions to anti-aircraft artillery units.

G-2

Although the anti-aircraft officer's relationship with G-2 may not be so extensive and varied as it is with G-3, nevertheless the former can make valuable contributions to G-2's work. Speaking generally, the anti-aircraft officer can be a valuable source of information on the enemy air situation and current tactics, and an expert adviser on reaching an estimate of enemy air capabilities in any situation. Through liaison with air force channels of dissemination and through his own AAAIS (Anti-aircraft Artillery Intelligence Service), he constitutes a readymade source of continuous information which G-2 can tap. As an expert in estimating enemy air capabilities, the anti-aircraft officer can estimate: extent and effectiveness of aerial observation; numbers and types of enemy aircraft within operational range; type and scale of air attacks to be expected; amount and type of protection provided by friendly air force elements; which troops and installations are most likely to be subjected to attack; nature and extent of damage to be expected; and amount of interference with successful accomplishment of our mission from enemy air action.

G-2 has another constant headache in which the anti-aircraft officer can help out—the *counterintelligence plan*. In this matter the latter can tell G-2 what types of troop concentrations, movements, and other activities can be observed from the air. He can recommend the nature and type of passive air defense measures necessary to avoid aerial observation—both SOP measures and special restrictions required by specific situations. He can differentiate between effective avoidance of observation by day and by night. In

secrecy restrictions on active defense, too, the antiaircraft officer can give expert advice—when and under what conditions troops should or should not fire at enemy aircraft. He can recommend the nature and type of assistance which G-2 might request from supporting air force units in the area in order to prevent effective enemy aerial observation. In training of troops in passive defense measures and in supervising the execution of the provisions of the counterintelligence plan the antiaircraft officer can also be of assistance. The engineer officer is of course the expert on technical means of using camouflage, but in active operations he will probably be much too busy to supervise passive air defense measures in detail. In this case the antiaircraft officer can very well fill in and perform this important function.

G-1 AND G-4

In his staff relationships with G-1 and G-4 the functions of the antiaircraft officer are for the most part limited to those matters which have to do with planning for personnel, administrative and logistical support of attached antiaircraft artillery units. The antiaircraft officer, upon attachment of his unit to the higher command, should be prepared to furnish G-1 with: authorized and actual strength of his unit; needs for replacements, by specialist serial numbers; and expected rates of losses in active operations. He should be prepared to furnish G-4 with:

1. Requirements of supply and maintenance peculiar to the attached antiaircraft artillery units, including amounts and types of special ammunition used by their weapons; units of fire from the various weapons; and rates of expenditure to be expected in different types of operations.

2. Logistical characteristics of antiaircraft artillery units attached—amount and types of equipment and supplies constituting their basic loads, amount and types of administrative personnel and transportation, available for loan and when such transportation can be spared.

In addition to furnishing the above information concerning his units, the antiaircraft

officer can give G-4 much help in the latter's plans for security of administrative troops and installations from air attack. He can recommend special passive measures of concealment, cover, dispersion and convoy discipline, and active measures to make full use of the organic weapons of service troops. He can supervise the execution of such plans by the service troops concerned. He can keep G-4 informed as to which of his administrative installations need antiaircraft artillery protection. Furthermore, he must maintain constant liaison with both G-1 and G-4 in order that his plans for antiaircraft artillery protection of administrative installations may be kept abreast of the changes in location and movements of these installations.

THE SPECIAL STAFF

In addition to his staff relationships with the general staff in their plans affecting the higher unit as a whole, the antiaircraft officer has direct dealings with various special staff officers on specific matters.

With respect to the artillery officer, the antiaircraft officer will have two principal matters to discuss: furnishing of antiaircraft artillery protection to field artillery units (at such times as the former is assigned this mission), and arrangements for using antiaircraft artillery in a field artillery role. In either case there must be close liaison and detailed coordination of plans. The antiaircraft officer must be made thoroughly familiar with the organization and characteristics of the field artillery units, and their tactics and technique. He must know the size and characteristics of field artillery units when considered as targets for enemy air attack. He must be familiar with the manner in which field artillery units displace in support of other arms. Coordination of planning must insure that antiaircraft artillery units are effectively tied into the signal communications plan of the field artillery, in order that the one may maintain effective and continuous protection of the other in moving situations. Plans for movements must be coordinated so that traffic conflicts may be avoided and so that field artillery may re-

ceive protection in movement as well as in position. For effective use of anti-aircraft artillery in a field artillery role all of the above coordination must of course be maintained. In addition, special arrangements must be made to bring the firing capabilities of anti-aircraft artillery under the efficient control of the field artillery fire direction center.

The signal officer also has much of common interest with the anti-aircraft officer. When an anti-aircraft artillery unit is attached to a higher command it is the responsibility of the signal officer to establish channels of signal communication to the command post of the attached unit. He should also familiarize the anti-aircraft officer as to special adaptations within the unit of the normal method of installing and operating signal communications, and provide him with a copy of the current Signal Operating Instructions as early as possible. In addition to normal relationship with commanders of attached units in signal matters, the signal officer has an important special interest in the anti-aircraft officer in connection with his own planning for warning systems. The latter brings with him an important addition to the warning means already present in the larger unit—the AAAIS (Anti-aircraft Artillery Intelligence Service). This element is the anti-aircraft artillery's own means of providing itself with warning of the approach of enemy aircraft. It should be tied into the larger unit's own warning system as soon as possible. The anti-aircraft officer can tell the signal officer precisely what warning means he has in his unit, describe accurately its characteristics, capabilities, and normal system of operation, and how to get the greatest benefit out of this warning service. By conferring, the two can arrive at plans which will make the most efficient use of the AAAIS and which will insure that it is effectively tied into the overall warning system.

To the anti-tank officer (when such is designated) the anti-aircraft officer brings an important and highly effective addition to the anti-tank means of the higher unit. Normally, of course, the anti-aircraft artillery

will be employed on its primary mission. Even so it is a valuable adjunct to the unit as a whole in case of a tank threat; the weapons may fire either from their anti-aircraft positions or from alternate positions occupied on order when the tank threat develops. Coordination of planning between the anti-tank officer and the anti-aircraft officer should insure that the antimechanized capabilities of the anti-aircraft artillery is utilized to the utmost consistent with the performance of its primary mission. The anti-aircraft officer can tell the anti-tank officer the number, type, and caliber of the weapons in his unit, their capabilities and limitations in bringing fire to bear on moving terrestrial targets, and their muzzle velocity, rate of fire, effective range, effectiveness of fire control, and penetration characteristics. The anti-tank officer in his turn can give the anti-aircraft officer instructions on measures for concealment and for obtaining mutual support, on special techniques of assigning targets and directing fire against tanks, and on selection and assignment of positions and fields of fire for the anti-aircraft artillery units. These two officers must insure through coordination of plans that the full antimechanized capabilities of the anti-aircraft artillery are effectively combined into the integrated overall plan for anti-tank defense of the larger unit.

The engineer officer and the anti-aircraft officer have community of interest on one principal matter—the utilization of camouflage to obtain concealment from aerial observation. The latter is specially qualified in the general matter of coordination of all active and passive measures for air defense; the former is an expert in the specific matter of utilization of natural and artificial measures of camouflage. These two staff officers should coordinate in planning for air defense to the end that the finished plan will have made full use of the special capabilities of each. The anti-aircraft officer, then, should plan for and supervise the overall air defense plan; the engineer officer should function as a technical expert on specific camouflage measures. As regards anti-aircraft ar-

tillery units themselves the engineer officer can help the antiaircraft officer in the specially difficult problem of camouflage for antiaircraft artillery positions.

Relationships between the ordnance officer and the antiaircraft officer revolve mainly around the problem of special supply and maintenance requirements of antiaircraft artillery units. In order to insure proper ordnance support for his units the antiaircraft officer should provide the ordnance officer as early as possible with information on: types of special ammunition used by his weapons; unit of fire for each weapon; expected rates of expenditure of ammunition in different types of operation; special types of ordnance maintenance and salvage necessary; and types of special ordnance maintenance units under higher headquarters whose services may be required for antiaircraft artillery units. The ordnance officer in his turn should orient the antiaircraft officer on the existing system of ordnance supply and maintenance in the higher unit, and experience on special maintenance techniques necessary under local conditions.

There are no special problems of coordination between the antiaircraft officer and the quartermaster and surgeon. These latter two should of course acquaint the antiaircraft

officer with existing procedures of quartermaster supply and medical evacuation, in order that the antiaircraft artillery units receive full support of these services. The antiaircraft officer can help the others with advice on active and passive air defense measures for their troops and installations.

The preceding paragraphs outline in general terms the matters which require coordination between the antiaircraft officer and various other staff officers of any large ground force unit. There are of course other problems which will arise in particular situations and which cannot always be foreseen in advance. The contents of this article, however, might furnish a basic check list of those *normal* matters in which other staff officers have common interest with the antiaircraft officer. But if nothing else were said on the subject at all, this one truth must be emphasized: It is absolutely essential that full, complete cooperation and teamwork exist between the antiaircraft officer and the rest of the staff—from the first moment that an antiaircraft artillery unit is attached. Failure to obtain this teamwork courts disaster for vital elements from enemy air attack; effective use of the antiaircraft officer is one of the keys to success for the force as a whole.

General Montgomery on Tactics

THERE are three broad principles which governed all the tactics employed from Alamein to the breaking of the Mareth Line.

First, I always aim at making the enemy dance to my tune. That is to say, if we want to beat the German generals—and the German generals are very good—we have to dictate the battle. To do that we have to decide in our minds, before the battle begins, how we want it to develop. We then use the military power at our disposal and force the battle to swing our way.

The second point is that when we are fight-

ing a battle we must always be so balanced or so poised in the whole area of operations that we are able to pursue our plans ruthlessly and never have to react to anything the enemy may do.

The third point is of great importance. We must strive to gain the initiative, and having gained it to keep it.

—From a speech by General Sir Bernard Law Montgomery, reprinted in *The Marine Corps Gazette* from the London *Sunday Express*.

Artillery in Breakthrough of a Defense Zone

Translated for the Command and General Staff School from a Russian article by Major General F. A. Samsonov, Soviet Army, in *Artilleriiskii Zhurnal* (Artillery Journal) January 1943.

OUR army was ordered to break through the German defenses and reach a certain line which would threaten the communications of a great German troop concentration. The neighboring forces on the right were on the defensive while those on the left were conducting a simultaneous offensive with the same goal in view.

Units of two German infantry divisions opposed the army. Enemy operational reserves consisted of approximately one infantry division. In addition, the Germans could bring reserves from the neighboring sectors of the front. These, on the basis of rough calculations, could not exceed a depleted tank division and two infantry divisions. Also, the enemy could receive reinforcements amounting to two tank divisions not at full strength, and three infantry divisions from the forward reserves. The reserves were expected to arrive on the third or the fourth day of the operation. Preparations for the offensive had to be particularly thorough, surprise had to be achieved, and rapid action was necessary in order to force the Germans to split their reserves and thus lose their effectiveness.

Our army was faced by a well developed system of field fortifications running in three lines. Due to the open character of the terrain, we reconnoitered the first one quite well. A forest deep in the enemy defense belt concealed the other lines. We could only surmise their nature. The Germans made strong-points out of several populated places, which were usually located on elevations and at a distance of a half to one kilometer from the edge of the forest. The defensive lines were composed of a network of full-depth entrenchments with communication trenches in between. Shelters for personnel were constructed in these deep trenches. They were covered with three, four, or even six layers of earth. Only separate firing positions in the depth of the defense were located in pill-boxes.

Sound and flash units were the only means

available to locate enemy batteries. The reconnaissance battalion of the army artillery located the position of 54 guns and howitzers and 38 mortars out of the expected totals of 66 and 141 respectively.

The battle formation of the army was in two echelons. The first one consisted of five divisions, four of which were deployed in the direction of the main effort. The divisions of the leading echelon were reinforced with tanks and had frontage of two to two and seven-tenths kilometers in the direction of the main blow, and of ten kilometers in the holding area. A part of the tanks composed a special mobile group designed to exploit the breakthrough. Two distinct plans of action were prepared for the mobile group and the choice was to depend on the exigencies of the situation.

The artillery was grouped in the following manner:

1. The Army Artillery Group included eighteen heavy artillery batteries.

2. The Army Antiaircraft Artillery Group consisted of two antiaircraft artillery regiments and a separate antiaircraft artillery battalion. One of the regiments was to be attached to the mobile group and placed under its commander as soon as the mobile group entered the battle.

3. The remaining reinforcing artillery and the mortar units were attached to the divisions participating in the attack. The artillery regiments of the divisions belonging to the second echelon were shifted to support the divisions of the first echelon striking the main blow.

The artillery was concentrated at the rate of 50.5 guns, howitzers, and mortars (not counting the infantry mortars) per kilometer in the direction of the main blow, and 15.6 heavy artillery pieces per kilometer in the holding direction. In certain sectors, the concentration was as high as 84.3 guns, howitzers, and heavy mortars per kilometer.

The missions of artillery were stated in an

order to the army and covered the following: engaging enemy artillery, silencing defensive firepower including antitank weapons, protecting the mobile group at its entry into the breakthrough, and repelling enemy counterattacks. An order to the army artillery, the plan for the artillery offensive, the plan for the advance of our artillery units with the development of the attack, and the plan for the supply and expenditure of ammunition were all included in the order to the army. In addition, a number of particular orders were issued concerning reconnaissance, the exact missions of separate artillery groups, the supply service, and so on. Special orders dealing with plans for the artillery offensive were also issued in division and army artillery groups.

The period of preparation lasted approximately seven days and was full of activity. The sector of the intended breakthrough was reconnoitered, the units reinforcing the army were shifted, our units were concentrated in the prescribed areas, supplies were brought to the front lines, and the units of the first echelon moved up to the line of departure and got set for the offensive. The complexity and scope of these operations is evident from the fact that five infantry divisions, several tank brigades, six GHQ artillery regiments, and several mortar units were brought into the zone occupied by our army. All movements were made in marching order, mostly along two roads. Ammunition and supplies necessary for the operation were brought by the same two roads.

The movement and concentration of our troops and other preparations for the offensive were effectively concealed from the enemy. This was confirmed by information obtained from prisoners of war and the lack of countermeasures on the part of the enemy. We were assisted by the army on our right, which was on the offensive and commanded the attention of the enemy. Moreover, our march discipline was excellent, the movements usually took place at night, and vegetation on our route offered abundant cover from aerial observation for our units at a halt and in assembly areas. Rains made roads im-

passable for motor transport and difficult for horse-drawn vehicles. The command quickly took measures to combat this threat to our operations. The roads were repaired at top speed and new bridges were built to replace those washed away. In a number of sectors where damage was particularly heavy, powerful tractors towed motor cars and trucks which could not pass under their own power. All this complicated the problem of concentrating men and supplies and upset our schedule. We could not be certain of the timely arrival of ammunition and other supplies. To add to our troubles, a crossing across a river on the front line was washed away on the eve of the projected offensive. The operation was postponed for two days. This time proved sufficient to complete the preparations.

The artillery preparation was planned to last an hour and a half. It was divided into three uneven periods: the first period of suppression, twenty minutes; the second period of suppression and destruction, forty-five minutes; the third period of suppression and destruction, twenty-five minutes.

During the first period, the artillery attached to the breakthrough groups and the army artillery concentrated on enemy firing positions and batteries. In the second period, they continued their work, while certain guns and batteries detached for the purpose were destroying strong fortifications of the enemy. In the third period, the barrage was increased by the action of new guns which fired directly at enemy pillboxes from advanced open positions. During the last ten minutes our heavy mortars joined the cannonade. The mortar fire was so very effective that the strongpoints against which it was directed were completely destroyed. Our infantry passed through them without a single shot or a bayonet charge.

During the period of artillery preparation, our dive bombers and Stormoviks [Soviet assault aircraft] also blasted at the Germans. Their targets were enemy batteries and probable assembly areas of enemy reserves. The artillery and aerial preparation

was on the whole successful—defensive firepower was thoroughly suppressed.

From an observation post overlooking the attack sectors of two infantry divisions, it was seen that after the artillery and aerial preparation only one enemy artillery battery, two mortar batteries, two separate guns using direct fire, and four machine guns remained in action. After seven or eight minutes of direct fire by our supporting artillery, the guns and machine guns were destroyed, and the army artillery silenced the one remaining enemy artillery battery. Two mortar batteries alone could not be located and continued the fight.

Artillery and aerial preparation was similarly successful on sectors of other divisions of the army. This was due to a thorough preliminary reconnaissance of the first German line of defense, the correct apportioning of firepower and various missions, and the accurate and sudden fire of our artillery and aviation.

After the artillery and aerial preparation, the infantry attacked. The supporting tanks were actually unable to participate in battle during the first and second days because they became stuck in mud and could not move. The infantry was accompanied by its own mortars and supporting guns. The latter were assisted in their advance by infantrymen, who were detached for this purpose by army order. But for a few exceptions, the supporting artillery kept up with the forward infantry elements. Half an hour after the end of the artillery and aerial preparation, forward enemy positions were occupied along the entire front. The attackers met little German resistance, quickly overwhelmed front-line enemy fortifications, and penetrated the wooded and marshy sector of the terrain. A battle in the forest began. After three or four hours, our forces advanced to the depth of four kilometers and reached the second German defensive line.

Batteries of the divisional artillery started to cross the river following the infantry. Bad roads and narrow crossings upset all schedules for shifting artillery battle formations. The entire divisional artillery left its

positions and advanced in disregard of the schedule. It was completely deployed on new lines only at the end of the day. So the batteries of the divisional artillery took practically no part in the battle during the second half of the day. The batteries of the Army Artillery Group did not change positions till the end of the day. By the morning of the second day, about a third of the army artillery formations changed their location. Thus, the entire artillery was ready to support the attack of the infantry and tanks.

The infantry forced its way through the forest belt in the depth of the enemy defenses. It was supported by accompanying guns. During this period our divisions rarely asked for support from the army artillery, but these requests increased greatly in number when they reached the edge of the woods and approached the second line of enemy defenses. During the second part of the day, army artillery and GHQ mortar units had to crush strongpoints in the second enemy defense line and beat back counterattacks. This mission they accomplished successfully.

No enemy reserves were brought into the battle during the first and second days. Evidently the German command could not decide upon the best use of the reserves. All this provided favorable conditions for the accomplishment of operational missions. The Germans were in the following plight: their artillery and mortars were silenced; their defending units suffered heavy losses, became demoralized, and ceased organized resistance; their reserves were too far away. The enemy command had to deal immediately with their very dangerous situation. Aviation was the only means available to contest our advance. Intensive German air attacks began on the very first day of the operation, as soon as our second echelon started to advance. The Germans made sixteen such raids on the first day, eighteen on the second, only ten, but in larger groups, on the third. The targets of air attacks during the first day were the crossings, the tank brigades, and the divisions of the second echelon moving to the field of battle. Only a minor part of the attacks was directed against our leading units, which

were then coming out of the forest. During the second day, most of the enemy air blows were aimed at our forward units.

In the second day of the offensive, our troops fought for the second and the third defensive lines. Enemy air attacks were made by groups of six to nine bombers during the first and second days, and of twelve, eighteen, and twenty-four planes during the third. German aviation was engaged by our fighter planes and antiaircraft ground units. Our fighters were outnumbered and during the first day they had no appreciable effect on the struggle with enemy aircraft. On the second day, they already began to strike at the German bombers, but still their achievements fell short of our hopes. The antiaircraft units were thus forced to bear the burden of fighting off enemy bombers.

The projected plan of operations of the antiaircraft units took into account the possible actions of the enemy aircraft. It stated the successive missions which were to be performed in the course of battle and required a certain maneuverability on the part of the antiaircraft units. The missions were formulated as follows, in the order of their importance: prior to the beginning of the offensive, the antiaircraft units had to protect areas of tank concentration and artillery positions; when the attack began, they were to cover the units of the first echelon and crossings; after the first enemy positions were smashed and the fighting raged in the depth of the defenses, they had to protect the crossings and the advancing units of the second echelon of the army; after the first echelon crossed the river and the second echelon approached the first, the defense was to shift to the new assembly areas; when the mobile group and the second echelon entered the battle, they were to receive protection from the antiaircraft units.

These antiaircraft units had the following artillery: thirteen medium guns (76 to 85-mm caliber), thirty-nine light guns, and forty-three multiple-barrel antiaircraft machine guns. These numbers were obviously small. Still, the antiaircraft units as a whole achieved the following results: not one of

our crossings was destroyed by the enemy; almost half of the dive-bomber raids passed without dive-bombing, or with bombing only from high altitudes which decreased greatly the effect of such attacks. During the first three days of the offensive more than fifteen enemy airplanes were destroyed.

During the second and the third days, our offensive developed successfully. Enemy attempts to strike at our right flank, protected by a river 120 meters wide, failed. These attempts were stopped by the careful planning of our command and the resulting timely arrival of a division from the second echelon, reinforced by artillery and mortars. Our fire halted all enemy assaults. Since the enemy had to bring units from the neighboring sector for the counterattack, the army next to ours was finally able to resume its offensive. It advanced successfully and brought up its flank even with the N-th Army.

The total results of the operation were the following. In less than three days the army accomplished its mission. It advanced forty to fifty kilometers along the entire front without substantial losses, without bringing the mobile group into battle, and without employing reserves except for one infantry division. Two German infantry divisions were completely destroyed, the German counterattack was smashed, and the successful development of our operation permitted the neighboring forces to carry on an offensive of their own. The enemy began to bring up operational reserves and throw them into battle one unit after another as soon as they arrived. The struggle became protracted; the operation entered its second phase.

We are not going to consider the further development of the offensive. Suffice it to say that in the next eight or ten days all missions were fully accomplished. The enemy had to employ all the above-mentioned operational reserves to combat our developing offensive. In addition, the enemy started an offensive on the neighboring sector, which forced him to withdraw several tank and infantry divisions from the south and thus decrease the tempo of advance in the Northern Caucasus and on the Stalingrad front.

Below are the basic conclusions drawn from the operation we have discussed:

1. Our success was determined by a number of factors. Our movements were well concealed and the blow was sudden. The breakthrough was organized on a wide front (the initial attack of the two armies was on a sector forty kilometers wide), which prevented the enemy from shifting his firepower and his men. Our forces were formed correctly and the reinforcing units were properly distributed.

2. Reconnaissance brought exact information about the first enemy defensive line as well as about the location of the operational reserves. But it obtained no data about the presence of the second and the third defensive lines and the separate strongpoints in the defensive depth. Therefore, our serial and ground reconnaissance failed to protect our forces against "unexpected occurrences" in the course of battle. Artillery reconnaissance provided the precise plan of targets in the first defensive line. Sound and flash reconnaissance gave quite exact coordinates of enemy batteries. Because the enemy left his artillery on its battle stations, we could compare the actual location of the guns with that obtained by sound reconnaissance. Sometimes the correlation was perfect. In most cases, reconnaissance by sound guaranteed the accuracy of Army Artillery Group fire. No observation planes were used for artillery reconnaissance or fire adjustment.

3. The artillery was grouped correctly and the missions were intelligently distributed. The creation of an Army Artillery Group at the disposal of the army artillery commander proved successful. We should also note the fine employment of direct laying. A part of the artillery concentrated on destroying enemy positions during the period of artillery preparation, while a considerable part was made ready for direct fire and for immediately accompanying the infantry. It went into action only when the infantry attacked. This method was so successful in silencing enemy firepower that in a number of cases infantry

units passed through the first enemy defensive line without firing a single shot and without any losses.

4. Experience confirmed once more the necessity of a brief artillery and aerial preparation. Accurate and sudden fire (the artillery preparation was opened by a salvo of the entire artillery firing simultaneously with a marginal error of only one minute) led to a thorough neutralization of enemy defenses. The power and the concentration of artillery fire reinforced by that of mortar units was so great that in certain sectors the Germans ran away even before our troops attacked. German will to resist was broken along the entire front of the offensive.

5. In spite of extremely unfavorable meteorological and topographical conditions, the artillery kept up an incessant fire during the battle through the whole depth of the enemy defenses. The means of fire included weapons of the Army Artillery Group and numerous supporting guns and mortars, which advanced within the formations of the attacking infantry.

6. The struggle against enemy aviation was not effective enough. The guns and the machine guns of the antiaircraft units were of limited use since they were few in number. It seems that at least eight antiaircraft machine-gun companies and twelve light and six to nine heavy antiaircraft-gun batteries are required to protect an army on a similar front. This estimate concerns the troops only and does not include additional protection necessary for stationary objects. Experience gained from this operation confirmed the fact that it is more practical to create an Anti-aircraft Army Group, rather than scatter antiaircraft defenses among divisions. The former system leads to greater maneuverability of antiaircraft units and permits their immediate concentration to protect a particularly important object.

7. The entire operation required only a small expenditure of ammunition. During the first three days, infantry mortars used up to 140,000 rounds; the supporting artillery,

56,000 shells; and the divisional and general support artillery, approximately 112,000 shells. As a whole, outside of the Army Artil-

lery Group, 1.5 days' ammunition supply was expended. The heavier guns used up 2.8 days' supply of ammunition.

The Division Neuropsychiatrist

Extracts from an article prepared in the Office of the Surgeon General and published in *The Bulletin of the U. S. Army Medical Department* March 1944.

THE ASSIGNMENT of a neuropsychiatrist to the staff of the division surgeon has been made necessary by the relatively high rate of neuropsychiatric casualties, especially in combat. It represents one of the most progressive moves yet made in military psychiatry. With the exception of induction centers and mental hygiene units in replacement training centers, psychiatric activity in the Army has been confined mostly to hospitals, with emphasis on diagnosis and disposition. In accordance with the policy of the Surgeon General, a new and more effective effort towards the development of preventive psychiatry has been placed in effect. The new division neuropsychiatrist will still have, however, an important responsibility in screening, diagnosing, and accomplishing dispositions. He will have also the opportunity to influence the placement of men, to work at mutual problems with the Judge Advocate and Provost Marshal, to be an adviser in training, and to work intimately with Special Services and morale officers.

A carefully selected group of officers has been assigned to this important duty. They have had from one to three years' experience in psychiatry in the military setting. Each will be the sole representative of psychiatry in a large combat team. It is hoped that this opportunity will prove to be one of the major contributions of psychiatry in the Army of the United States.

The functions of the division psychiatrist are set forth in section V, War Department Circular 290, dated 9 November 1943. This circular outlines clearly the duties and responsibilities of the psychiatrist.

The functions of the division neuropsychiatrist listed in Circular 290 are as follows:

1. Advise in all matters pertaining to the mental health of the command.
2. Maintain a continuous screening process for the purpose of detecting and promptly eliminating individuals emotionally unfit for military service.
3. Be available for the early treatment of normal individuals who suffer from minor correctable maladjustments to Army service.
4. Assist in a program of preventive psychiatry, especially in its relationship to discipline and morale, through educational programs and informal discussions with line officers and others who may seek his advice.
5. Facilitate reclassification procedures to assure as far as practicable the proper assignment of personnel.
6. Be available as consultant to courts-martial and other boards where his services are indicated.
7. Visit division dispensaries and advise in management of psychiatric and psychosomatic problems.
8. Supervise the maintenance of proper records of neuropsychiatric conditions within the command to the end that adequate information accompanies each patient evacuated to the rear.
9. Keep constantly oriented to the changing psychiatric problems during training, pre-combat, and combat periods, with a view towards developing the mental toughness essential to combat troops.
10. Supervise the management of neuropsychiatric casualties during combat.

Division neuropsychiatrists go into their new jobs as pioneers, missionaries, educators, and salesmen. Each one can be a most important factor in the success of a division. They are expected to write a great chapter in American psychiatry.

Base Your Plans on Future Weather

LIEUTENANT COLONEL DONALD H. FORD, *Air Corps**

Instructor, Command and General Staff School

WEATHER has always been a factor in military operations. History is replete with examples of the part weather has played in battle. Weather affects every branch of the Service, and every staff officer, be he in the one, two, three, or four section, has to deal with the problem of the effect weather may have on his staff planning and operations. No one section is immune to the problem of weather, as weather has its effect on personnel, on supply, and on tactics. The impact of weather on an operation may be terrific. John Masefield in his book, *Gallipoli*, in describing the Dardanelles campaign, shows how one storm affected a command.

"This was the blizzard of the 26th-28th, which lost us about a tenth of our whole army from cold, frost bite, exposure, and the sickness which follows them. . . . When the weather cleared, the beaches were heaped with the wreck of piers, piles, boats and lighters, all broken and jammed together. But great as this wreck was, the wreck of men was even greater. The 29th Division had lost two-thirds of its strength. In the three sectors over 200 men were dead, over 10,000 were unfit for further service, and not less than 30,000 others were sickened and made old by it."

In the Italian campaign in Greece, immediately after the Italian declaration of war and the movement of their troops, a period of rain began which bogged down the Italian advance. This gave the Greeks time to complete mobilization and occupy their defensive positions. October and November in the Balkans is the rainy season and launching a campaign in face of it enabled General Mud effectively to render the Italian mechanized units quite useless.

The successful moving of the *Scharnhorst* from a French port through the English Channel was achieved by clever use of the

weather. The Japs followed a severe storm into the Aleutians. We were successful in the Bismarck Sea because weather failed the Japs.

Our progress in Italy has been criticized by many as far too slow. Ernie Pyle wrote as to this: "The war in Italy is tough. The land and weather both are against us. It rains and it rains. Vehicles bog down and temporary bridges wash out. It is not the fault of our troops that the northward path is a tedious one. It is the weather and the terrain and the weather. The troops are living in a way almost inconceivable to you in the States. The fertile black valleys are knee-deep in mud. Thousands of men have not been dry for weeks. Other thousands lie at night in the high mountains with the temperature below freezing and the thin snow sifting over them. . . . No one who has not seen this mud, these dark skies, these forbidding ridges and ghost-like clouds that unveil and then quickly hide your killer, should have the right to be impatient with the progress along the Road to Rome."

The German side of the situation is given in a Berlin broadcast: "On the South Italian front the German soldier not only fights the Anglo-U. S. enemy but also must overcome the obstacles of mountain terrain, crisscrossed by many ravines. While the troops fighting in the barren, rocky country are exposed to cloudbursts which turn the ground into mud and the rivers into torrential floods, a sudden turn in the weather covers the contested heights in thick snow and freezes the water. Under these difficulties the supply services in particular have many difficulties."

General Kenney makes the statement that the Fifth Air Force is fighting three forces: the weather, geography, and the Nips, and that the least of the three is the Nips.

Weather as it has affected past campaigns is an intensely interesting subject. Space will not permit the consideration of more cases. Our problem is what can a commander and his staff do about weather.

*The writer wishes to express his appreciation to Colonel William W. Jones, A.C. and to Colonel W. H. Neal, A.C. for their constructive suggestions in the preparation of this article.

It has been said that there is no such thing as unfavorable weather, that weather is never unfavorable. It is only unfavorable to those who are not prepared for it.

The essence of weather insofar as staff planning is concerned is not what it is today, but what it will be when the battle is fought. When we know tomorrow's weather, we can use weather both as a spear and as a shield. Surprise is an age-old principle of war. The commander who is surprised, regardless of the source of the surprise, is at a distinct disadvantage. Surprise by weather may prove as fatal as tactical surprise by the enemy. The commander who studies weather can avoid the surprise of adverse weather. He is forewarned and thus forearmed. If he knows what weather is to come, he can modify his plans to meet the changing weather.

His staff must be weather conscious. The staff planning must be so flexible that it can meet the factor of weather. To illustrate: Vehicles may be slowed by mud, roads may become impassable, bridges may be washed out, aerial observation and attack may be denied, and supplies may be destroyed. The effects of heat and cold, dryness and dampness are factors that must be met in staff planning.

The problem becomes, what can the commander do, what steps can he take, to insure that he and his staff will have the best and most complete information as to weather? † How can he be sure that the effects of this weather are fully taken into account? In short, how can he prepare and plan for weather?

There are at least four sources of weather information that he should exploit constantly. These are:

1. Climatic Studies.
2. Special Meteorological Advices.
3. Long-Range Forecasts.
4. Short-Range Forecasts.

†The world has been divided into Weather Regions and each region has a Weather Regional Control Officer. The Weather Regions operate under the Army Air Forces. The Weather Regional Control Officer is charged with the duty and responsibility of filling the weather needs of all military units in his region. Weather information is directly available to ground troops. A short cut to the ground commander for obtaining the latest weather information is through his Air Party.

For planning of operations, the climatic study, the special meteorological advices, and the long-range forecasts are invaluable. All commanders and their staffs should be familiar with these tools. Let us examine each of them.

The general type climatic study is prepared by the Weather Information Branch, Headquarters, Army Air Forces. It is entitled "General Climatic Information Guide." It is a numerical series, each numbered study covering a different locality. No. 1 of the series covers the "Climate of Frankfurt (Germany)."

The study is concise and to the point. It is but four pages. The first page covers the following topics:

Location and Topography—a brief outline of the location of the place under consideration and its topography (which affects weather indirectly).

Representative Climatic Station—gives basis of observations and the period of time over which the observations were made on which the study is based.

General Climatic Conditions—this section considers separately: Air Masses, Temperature, Precipitation, Cloudiness, Fog and Visibility, Winds, and a comparable U. S. station.

The second page is entitled "Military Implications of Climatic Conditions." This is in tabular form. It lists a particular military operation (one section being air and the other ground), shows opposite it the weather factor or factors that might affect it, and in the next two columns gives as to the weather factor the months of most frequent occurrence and the month of least frequent occurrence.

The remaining two pages of the study are devoted to charts. There are twelve charts in all, as follows:

Figure 1—Topographic Map.

Figure 2—Soil Trafficability Map.

Figure 3—Temperature Chart.

Figure 4—Frequency of Temperature Levels Chart.

Figure 5—Monthly Precipitation Amounts Chart.

Figure 6—Number of Days with Precipitation Chart.

Figure 7—Precipitation Spells Chart.

Figure 8—Number of Days with Snow Cover and Wet Soil Chart.

Figure 9—Mean Number of Clear and Cloudy Days Chart.

Figure 10—Days with Low Ceilings and Visibilities Chart.

Figure 11—Wind Frequency Distribution.

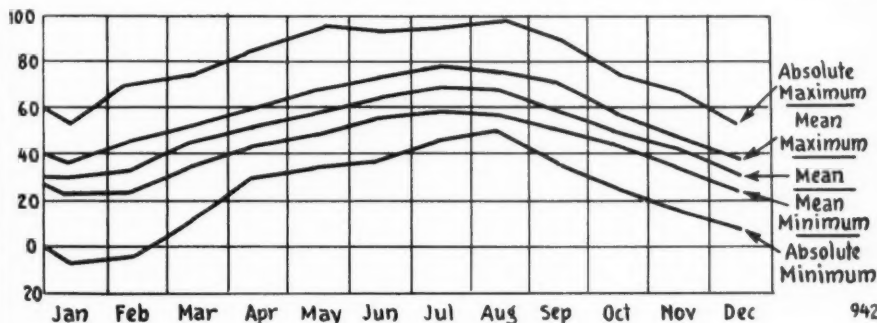
Figure 12—Surface Wind Rose.

A new feature of many of the charts above listed which adds materially to their value

From a study of this chart, the staff planner can tell at a glance the average temperature that he may expect for the day and the night. He can also determine the coldest and the warmest he may anticipate. Thus he can add a safety factor to his planning which he knows he can rely upon.

The climatic study should prove invaluable to the commander and his staff in connection with the planning for future operations.

The second source of weather information is the special meteorological advice. The Weather Division is prepared to make any special weather study that may be desired by a military commander. Outline to the Regional Control Officer the type of military operation contemplated and a special meteorological



is that, in addition to showing the mean, they show the extreme. This may prove especially helpful.

By way of illustration: Suppose operations are planned for a month hence. Let us look at the temperature chart found in one of the climatic studies.

Note that the temperature chart shows five temperature categories:

Mean—average daily periods.

Mean Maximum—average maximum daily.

Mean Minimum—average minimum daily.

Absolute Minimum—the coldest ever recorded for the period.

Absolute Maximum—the warmest ever recorded for the period.

study will be prepared giving information on such subjects as winds, rains, tides, sea swells, seasons, soil conditions, and any other type of information involving the factor of weather.

Special studies have been made on such problems as:

1. Locations of camps, training areas, depots, landing fields, and the like.
2. Coastal areas most suitable for amphibious landings.
3. Operations of aircraft over certain mountainous areas.
4. Smoke behavior in specific localities.
5. Soil trafficability in military operations.
6. Wing icing conditions throughout the world.

In fact, wherever a special military operation is contemplated, a special weather study of the weather factors that might affect the operation should be considered.

Next, let us examine the long-range forecast. Any forecast over thirty-six hours is normally considered "long-range." In some theaters, forecasts of twenty to thirty days are attempted, but the present issue of the Weather Division is a ten-day forecast. The forecast is entitled "Forecast for [day-month]—[day-month] 1944." This forecast of necessity will be completed a short time prior to the first day of the forecast. Thus the "Forecast for 19 June—28 June 1944" was completed on 16 June 1944.

The forecast is divided into sections. The first part contains the forecast for the period. Forecasts are made as to sixty-two different localities and the coverage is the world. These forecasts give general weather (whether clear or cloudy and the extent of the overcast), temperature, precipitation, humidity, and winds.

Another section of the forecast is made up of prognostic weather charts—a chart for each day covered by the forecast, showing for the major portion of the northern hemisphere the following conditions by areas: (1) Clear, (2) Cloudy, (3) Low ceiling with good visibility, (4) Low visibilities with good ceilings, (5) Low visibilities with low ceilings or sky obscured, and (6) Precipitation.

Another section contains kinematic weather charts for each five-day period of the forecast. The charts show the areas of persistent lows and highs and the paths of movement of the high and low areas. These are of value in interpretation of the first section, the general forecast. By following the movements of the pressure areas and comparing them with the short-range daily forecast, it can be determined whether the long-range forecast is getting out of phase, and adjustment can be made which will increase the accuracy and value of the long-range forecast. (This is a task for the Staff Weather Officer.)

The last sheet of the forecast contains sun-

light, twilight, and darkness diagrams for the world shown by solar time.

It must be admitted that the long-range forecast is not as reliable as the short-range forecast. Definite improvements, however, have been made in the accuracy of these forecasts and it is believed today that the long-range forecast is sufficiently accurate to provide a staff-planning factor for future operations. It is believed that the ten-day forecast for a zone of variable weather will be correct sixty to seventy-five percent of the time.

The fourth source of weather information is the short-range forecast. Short-range forecasts are usually issued twice daily at all forecasting stations of the basic weather service. These forecasts are in great detail, especially when describing variable conditions over a considerable area. The short-range forecasts are very accurate up to twelve hours and are far ahead of a forecast based on climatology for the twenty-four to thirty-six hour phase of the forecast. The short-range forecast is a valuable tool of the staff planner. If the staff planner has taken into consideration the exigencies of weather, the short-range forecast, warning him of a change in the weather, permits him to initiate the necessary modification of his plan and to adjust it to meet the approaching weather change. The plan having been planned, the short-range weather forecast is the tip-off for the play.

The short-range forecast is a most valuable tool to a division commander. If he knows twelve hours in advance that his area will be covered by ground fog, he can plan his maneuvers accordingly. A forecast of a low ceiling means to him that he can move without aerial observation but that he must move without air support. The information that a sudden thaw is coming will suggest that he keep his vehicles off spots that will mud him down. The knowledge of a heavy rain may be the determining factor whether to defend or to attack and over what type of ground. The weather of each succeeding few hours is one of his most needed elements of information.

These, then, are the tools of the commander and his staff in planning as to weather:

1. The Climatic Study.
2. The Special Meteorological Advice.
3. The Long-Range Forecast.
4. The Short-Range Forecast.

We must exploit these tools to the utmost. We must incorporate in our planning, our strategy and tactics, the factor of weather. Weather must never be overlooked or taken for granted.

March Discipline in the Combat Zone

AN OFFICER with considerable experience in combat has this to say about march discipline for field artillery units:

"On February 17th of last year, we knew little about motor marching; we had done little of it. Never had we made an extended march of over 200 miles. However, in the next four days we learned much on this subject. We had the opportunity to learn a practical subject the practical way. We made a forced march of approximately 800 miles from Tlemcen, Algeria, to Thala, Tunisia, over poor, hazardous roads. We left our Tlemcen bivouac at dusk in a snow storm, and in the middle of the night 100 hours later we went immediately into combat against part of the Afrika Korps.

"For four days we were on the move almost continuously. During the march we learned the importance of having plenty of well-trained assistant drivers. At the end of our march our regular drivers were almost exhausted. We found that the person in the front seat with the driver has to stay awake and assume the responsibility of keeping the driver alert. When road space is at a premium, the overextension of a column, we learned, is almost as serious as closing up. On several occasions our column was ordered to close up, although we taught our drivers to close up only on orders from an officer or an MP.

"These are some things we found very important:

"1. The liberal use of road markers. We used excellent men for this purpose; they were especially trained and took pride in their job. We also had several officers trained in route marking.

"2. The assignment of a senior officer to tail our column.

"3. Tail lights for towed weapons. If such tail lights are not issued they must be improvised; otherwise it is very probable that vehicles will be damaged by running into such weapons in the dark.

"4. The practice of leading the column with the slowest and heaviest vehicle in the convoy. Gradual changes in speed and distances by individual vehicles are, of course, basic principles of marching, and we found them essential in practice.

"5. The morale effect of a smart-appearing column. An outfit moving to the front reflects its discipline in its march column. When a column is well spaced, with its vehicle tops uniformly and neatly arranged, vehicle loads neatly piled, and men uniformly and properly dressed and conducting themselves like soldiers, the result impresses not only our own troops, but foreign troops and the civilian population. It raises everyone's confidence, including our own.

"6. Close and careful supervision by the battalion commander, his staff officers, and the battery commanders. This is necessary not only to obtain but to maintain good march discipline. In Morocco, Algeria, Tunisia, and Sicily my battalion marched 4,123 miles in battalion column between January 15th and August 22d of last year. Without exception the first day of each long march was ragged. March discipline constantly improved throughout each march—only, however, as a result of very close supervision."

D A R A

MAJOR JAMES C. DAVIE, *Quartermaster Corps*
Military Training Division, Office of the Quartermaster General

THERE is a common expression used in everyday life which is intended as a compliment, i.e., "So-and-so is right in the groove." That is exactly what is wrong with a large number of military instructors. Webster defines a "groove" as a "rut" and adds that it also means an habitual course or a fixed routine. For the good of the service, any instructor who is "right in the groove" had better get out of it—and quickly. Unless an instructor has imagination and is really interested in his subject so that it becomes a live, animated, dynamic activity, he will waste time and his students will not profit. Professor Ordway Teed in *Human Nature and Management* has this to say:

"Interest is present where the person doing and the thing being done merge into an absorbing and sustained performance of some accomplishment. The person acting and the thing acted upon become, for the time, a living, dynamic unity of human experience."

This is undoubtedly the secret of conducting interesting instruction. Prior to the presentation of a subject on the platform, an instructor must introduce into his formula, which is outlined in FM 21-5 and *Methods of Teaching* (Quartermaster Corps Handbook), ingredient "X." The manuals are strangely silent concerning this ingredient. It consists of one word—*perspiration*!

There is nothing quite as soporific as the listless drone of a disinterested instructor, performing what is to him a chore which must be accomplished within a fifty-minute period. It is unfortunate indeed that the atmosphere which he creates cannot be reduced from the abstract to the concrete in the form of an anesthetic which could be more appropriately used by the Medical Corps. I have attended conferences (so called) the effect of which was more anesthetizing than any drug, GI or otherwise.

The presentation of a subject should be judged by four questions:

Is it dynamic?

Is it animated?

Is it realistic?

Is it applicatory?

Those who have been wondering what the title of this paper means will find their question answered if they take the first letter in each of the four key words. Incidentally, this is an easy way to remember these principles. An instructor can ask himself, "Is the instruction I am giving, or about to give, DARA?"

It matters not what subject is being taught. A good instructor and one who is worthy of his salt can make people want to hear him time and time again. There is not a single subject being taught in the Army today which cannot be more successfully taught if these four principles are observed. Probably a smart aleck is going to ask, "What about Graves Registration?" I might answer that question by saying that this activity is the only one in which the Quartermaster Corps is engaged in which no complaints are received from customers. And I might also remind that inquirer that the exception always proves the rule. It is interesting to note that MTP 10-101, dealing with this subject, provides that there will be applicatory exercises. In view of the manpower shortage, I will meet that inquirer half way in granting that the requirement for applicatory exercises in connection with the burial of the dead should not be taken too literally.

The ancient philosophers, unlike hurried people of today, were very particular in defining the terms they propose to use in their discourses before discussions commenced. We can learn a lesson from them.

Dynamic.—The word dynamic originated in ancient Greece and is derived from the Greek word *dynamikos*, meaning powerful. In instructional work it can be interpreted as meaning instruction which is characterized by energy and force. This is the starting point, and instructors should bear in mind that the material they propose to deal with should be dynamic to the extent that the dynamism of the instructor is unconsciously

absorbed by the student and motivates him in his applicatory work which is the final phase of the presentation.

Perhaps someone will say, "What do you suggest?" New York University, in one of its fairly recent publications, contends that the first sentence, like the redskins who bite the dust in the opening sentence of western thrillers, must crash through one's audience's initial apathy. This thought might be carried a bit further and it be contended that overcoming of apathy is not limited to the introductory remarks. It should be continued throughout the instruction. In order to make instruction dynamic, an instructor must become a master of metaphor—his nouns must bleed, his verbs must rattle, his adjectives must jolt, and his adverbs must sting.

One of the most valuable tools in developing alternate expressions, instead of the trite expressions which the average instructor is accustomed to using is a good book of synonyms and antonyms. Unfortunately, modern authors have neither the time nor the inclination to write books of this type from which an instructor can obtain fine shades of meaning and similar fine shades of divergence. (The author considers as one of the best books of this character one written in 1895 by Dr. James C. Fernald. This gentleman, like all scholars of an older day, was educated in the Greek and Latin classics and took plenty of time to develop the finely drawn shades of meaning between similar words.) This is not the proper medium in which to discuss in detail some of the synonyms and metaphors which will assist an instructor in perfecting dynamism of instruction. If he is interested, he will procure a copy of some of the more scholarly reference books of this type.

Animated.—The word itself is derived from the Latin word meaning soul. When the word was first used, the connotation of the words "life" and "soul" was synonymous, particularly among philosophers. The popular interpretation of the word animated at the present time is alive, or full of life. The antonyms of this term are more striking from our viewpoint than the term itself. Some of them are, depressed, deadened, and dispirited. How can

instruction be made animated? Well, in the first place, the instructor himself must be full of animation when he steps on the platform. He must have thoroughly convinced himself that the subject he is about to teach is a live subject. Instruction which is dynamic alone is not as lasting and convincing as when it is coupled with animated instruction. Dynamic instruction may be considered the force, and animated instruction the medium. The audience must respond wholeheartedly; and they will if both the instructor and his audience are about to relive a human experience. Here is where visual aids are effective. Irrespective of the impressiveness of the instructor's words, eighty-five to ninety percent of what we learn and retain is through the sense of sight, and there is nothing as conducive to animated instruction as visual aids. Certain instructors believe that visual aids must be used but they do not introduce sufficient ingredient "X" when determining them. An inappropriate visual aid serves merely to distract, and I must confess that a great many of our so-called visual aids are merely eyewash intended to impress some visiting military dignitary. A great many instructors are not sufficiently interested in their subject to prepare visual aids which help them to animate the subject they are about to present, and they use visual aids only when an inspector is around. (The Command and General Staff School is one of the few service schools which has mastered the art of using appropriate and especially prepared visual aids in conducting instruction.)

Realistic.—In the study of philosophy or pure science, the term realistic means after the manner of realism—a school of thought opposed to nominalism. We are not concerned with the precise meaning of this word from a philosophical viewpoint. The term will be considered in the popular sense or meaning, as dealing with problems as they exist and not as theory dictates they should be. Reports coming back from theaters of operations overseas, prepared by officers who have taken part in operations, say that the instruction in our Army is too bookish and theoretical. Instruction should be conducted in such a man-

ner that a student should not react to a situation in this fashion—"I wonder what the book says." His instruction should have been so realistic that when he is confronted with a situation his subconscious will dictate to him quickly and accurately a proper solution. He will have learned logical and proper methods of accomplishing tasks because he has been taught in a realistic manner. Some of our older officers will recall an expression used in advertising by a certain motor car manufacturer, "Ask the man who owns one." I am going to paraphrase that expression a bit and say, "Ask the man who's been there."

Applicatory.—The word applicatory means applying what one has been taught to a typical situation. The instructor's obligation in this connection is to prepare problems

which will give his students an opportunity to apply what he has endeavored to teach them to practical situations. FM 21-5 states that "application is the final step in the teaching process," but unfortunately it is honored more in the breach than in the observance. Nothing is quite as effective in helping a student to retain what he has learned as giving him an opportunity to apply his knowledge. Ingenuity? Of course. Ingredient "X"? In liberal quantities. Sometimes an applicatory exercise will require more time than the presentation of the subject itself; in the majority of instances it will. The return an instructor will receive for this, however, will repay him a thousandfold in the feeling that he has taught and not merely talked.

Early Experiments with Blockbusters

UP TO now there hasn't been spoken or printed an official word to suggest that any American airplane anywhere has dropped a 4,000-pound blockbuster bomb on either the Germans or the Japs. Yet the blockbuster—like the dive-bomber, the aerial torpedo, and other powerful modern mechanisms of war—is strictly an American invention.

It was more than twenty-two years ago, in the autumn of 1921, that the Army's Ordnance Department, in conjunction with the Air Corps, first developed and tested the two-ton bomb. The test was conducted at Aberdeen Proving Ground, Maryland.

The November-December 1921 issue of *Army Ordnance*, the official publication of the Army Ordnance Association, says that the bomb was "proportioned to hold as much explosive as possible, for it is mainly upon the amount of explosive carried that the destructive effect . . . is dependent." The article went on to say that "some . . . may well wonder if there will be need for so large a bomb. There is no doubt of this, only the tactical use of such a great weapon remains to

be determined. In this 4,000-pound bomb a design has been worked out which is easily capable of expansion . . . as the carrying capacity of aircraft increases."

This jibes with the British obliteration bombing theory that the greater the package of explosive dropped the greater the resultant destruction: the overall destructive effect is caused by the blast. Actually, fragments from the bomb case cause only a fraction—and an exceedingly small fraction at that—of the total damage. Further, it appears to have been proved that the blast waves are particularly effective against the stone and brick masonry structures of the Old World, which crumble under the quick one-two of the explosion of the blockbuster; more so, in fact, than steel and concrete.

It is interesting to note that still larger bombs were under consideration even then, and the recently announced use of four-ton superblockbusters by the British serves only to confirm the Aberdeen promise of more than two decades ago.

(From *U. S. Air Services*, March 1944)

Fighting the Uncommon Cold

Winterization Kits for Army Vehicles Now Available

Prepared for the MILITARY REVIEW under the direction of the Director,
Maintenance Division, Army Service Forces.

Publication of this information at the present time will be of value for two reasons: (1) The fact that winterization kits are available, and that they play an important part in maintaining efficient operation of vehicles in cold weather areas, is not widely known. (2) Considerable time is required for shipping and installing winterization equipment and, in order to make full use of it, officers concerned must be alerted to the situation well in advance of the winter season.

WHAT the Common Cold is to men, the Uncommon Cold is to motor vehicles—that paralyzing cold of steady, below-zero temperature we so often have to cope with in this “global” war.

Just how much time can be lost when vehicles are left to the mercies of the weather overnight, is well illustrated in the incident of the two vehicle companies operating in a cold weather area during the early days of the war.

At the end of one particular day, one unit commander issued orders for each driver to drain the oil and coolant from his vehicle and to remove the battery. These items were then stored in a heated building overnight, since a temperature drop had been predicted. The other commander took no steps further than having the coolant in his vehicles checked to see that it contained sufficient anti-freeze for the expected temperature drop. The next morning, within a comparatively short time, the first unit was operating full force, the heated oil and coolant and warm batteries having enabled the drivers to start their vehicles immediately. The second outfit had only about three vehicles in operation by early afternoon!

Naturally, the process used by the first unit, though very commendable in this instance, is not a particularly efficient method, inasmuch as it takes considerable time and

effort. And that's why the Army has developed an imposing array of winterization equipment to help you fight the Uncommon Cold.

So if you're on your toes, you can make things a lot easier for yourself just by filling out a few requisitions. For the winterization equipment that is now available will help you get your vehicles going on the coldest mornings and keep them from struggling through the winter. It may be so cold you have to light your cigarette with a blowtorch because a match flame freezes. You may be numb as a mummy yourself—but your truck has a foot-warmer, your tank has snow shoes, and your tractor wears a poncho for a nightgown.

For general purposes, this winterization equipment is grouped into two general classes. Class A items are termed “improvements to the basic vehicle which will be made on all applicable vehicles for future production.” That means your vehicles may have them already, but if they don't they can still be installed. For example, the brackets needed to install windshield and door porthole covers must be attached to the vehicle as permanent installations, and therefore are called Class A items. The covers themselves, however, are Class B items, or “items which may be quickly and easily installed and which are necessary for vehicles which are expected to operate in sub-zero temperatures.”

What you will actually order is one of the Winterization Kits, Interim Kits, or Auxiliary Cold Starting Aid Kits, depending on what vehicles you have. The Interim Kit, or “quickie” kit, is simplest of all. It's the granddaddy of the other winterization kits, as it has been in common use for a considerable length of time, whereas the Winterization Kit is a much more recent development. The “quickie” kit contains an underchassis heater and a shroud, and all you have to do when you requisition one is to tell the kind of vehicle it's to be used with. In general, these

kits are used for vehicles for which no other winterization equipment is provided.

The Auxiliary Cold Starting Aid Kits, or "slave" kits, are more elaborate than the "quickies" but they are not so complete as the Winterization Kits. Slave kits contain heaters, auxiliary batteries, and other electrical equipment which is used as an aid to starting in cold weather. Their prime use is for servicing of groups of vehicles which have no specific winterization equipment.

It is the Winterization Kit which will be of most value to personnel operating vehicles in areas where the temperature stays below zero consistently. These kits are very complete, and are designed for specific vehicles. Basic equipment included in a Winterization Kit is comprised of a battery heater, a cab and engine compartment heater, and radiator and louver covers—all of which are permanent installations and thus are always ready for use with a minimum of preparation. Depending on the vehicle, there are numerous other items found in the various kits. Therefore, when requisitioning one of them you will have to look up the listing given in War Department Supply Bulletin 9-16 (SB 9-16), dated 2 March 1944, to find the number of the kit you must specify for your particular vehicle. Incidentally, this bulletin also lists territories for which winterization equipment will be furnished, so you will have to refer to it to find out if you're eligible.

Probably the best way to give an idea of the items you'll find in the various kits is to cite a few examples of the equipment available for a number of different vehicles. The Chevrolet Bomb Service Truck M6, for instance, is supplied with a Winterization Kit which contains the following items:

- Insulated battery box with heating coil.
- Gasoline heater to heat battery.
- Petcock for bottom of gasoline tank (for easy access to fuel used in the heaters).
- Primer system.
- Engine oil dilution system.
- Crankcase ventilation system.
- Radiator cover.
- Electric windshield defroster.

Hot water heater (foot-warmer).
162° thermostat.

Fuel pump diaphragm.
Tarpaulin.

Underchassis heater.

Before operation of the vehicle it is necessary to warm the oil and the battery to a point where cranking is made easy. This is accomplished by means of the tarpaulin and underchassis heater which is placed under the crankcase, and the gasoline battery heater, located beneath the insulated battery box. Then the primer system does its job of providing a rich fuel mixture which is injected directly into the intake manifold.

The primer used here calls for installation of a new manifold, designed to accommodate the primer nozzles. In addition, a new accelerator rod and a new metering rod are provided. In some cases, the addition of primer nozzles and a line to the manifold does not require installation of a new manifold.

During operation, the engine temperature is controlled by the 162° thermostat and the adjustable radiator cover, and the battery temperature is kept up by means of a hot water heating coil under the battery and inside the insulated battery box.

After operation, but before stopping the engine, the oil is diluted with gasoline by means of the engine oil dilution system. Thus the oil is more easily kept in a fluid state. The crankcase ventilating system serves to take this gasoline out of the oil when the vehicle is next operated and the oil has become warm enough to flow as it should.

The windshield defroster, the hot water heater in the cab, the bracket for stowage of the underchassis heater on the running board, and the straps for holding the tarpaulin when it's stowed away—all items that provide for the convenience or comfort of the operating personnel—may often be equally vital to efficient operation of the vehicle.

The Winterization Kit for the Chevrolet 4 x 4 contains much the same equipment as the kit for the Bomb Service Truck. The main difference is that an engine coolant heater is provided instead of the underchassis heat-

er. By starting this heater some hours before the vehicle is to be operated, the coolant is heated to a temperature which warms the engine sufficiently to make starting easier, in combination with use of the other cold starting aids.

The type of heater provided in this case contains a small gasoline burner of the pot type which is fed by gravity from an auxiliary fuel tank. Air for combustion is furnished by the draft produced by a small flue, and installation of this flue, or stack, requires the cutting of a hole in the hood. Templates are included with the winterization equipment manual for use in installing this stack, as well as templates for the reserve fuel tank. This type of heater is lighted with a "torch" and may be burned continuously for periods of hours.

There is another kind of engine coolant heater which operates in a somewhat different manner. In this type, the heater is controlled by an electrical switch from inside the vehicle, and the installation includes a fuel pump unit for supplying fuel from the vehicle's fuel tank to the burner, a blower for supplying air for combustion, an ignition transformer to provide automatic ignition of the fuel, and a motor generator unit (operated by a storage battery) to drive the blower and fuel pump and to supply current to the transformer. Since this heater is much quicker acting than the one mentioned above, it should be burned only for periods of fifteen minutes at a time, according to instructions given in the manual. This is to prevent overheating. An added feature of this heater is its possible use in portable form as a winter aid in thawing out frozen brakes, tank treads, or other parts, or in servicing vehicles not having heaters of their own.

Two items not supplied for the vehicles so far mentioned, are included in the winterization equipment provided for the 6 x 6 Diamond T Truck. One is the air-brake alcohol bleeder system, which prevents freezing of moisture in the air brake lines and valves by introducing alcohol into the air brake system. The other is the set of metal louver

covers for the fender shield and hood louvers.

The equipment installed on a tank or gun motor carriage is somewhat more elaborate. It includes a gasoline driven motor with fuel tank, control box, and heater box. Heat is forced to the exterior of each of the lube oil tanks and to the battery compartment through flexible tubing and ducts, and four shutter sections serve to retain heat in the engine compartment. The oil cooler is protected by a heavy fabric cover with a roll-up flap. Also included are air intake and outlet shutter assemblies. In this case, as is true of some installations, it is necessary to make some changes in the wiring system.

Miscellaneous equipment includes smaller items, such as plastic windshields for armored windshield slits, ice grousers, half-track idler scraper blades and brackets, and cut-out snow shoes for tractors.

Needless to say, the installation of winterization equipment, no matter how complete it may be, is not a panacea for cold weather operating problems. For without the proper attention to other phases of operation, no equipment can be expected to perform effectively. Instructions in OFSB 6-11, "Cold Weather Lubrication and Service of Combat Vehicles and Matériel," must be faithfully followed in connection with the use of winterization equipment. This involves use of winter grade of gasoline and lubricants and checking of mechanical features to be sure they are all in proper working order.

Brushes, commutators, and bearings on the generator and starter must be clean. The large surges of current which occur when starting a cold engine require good contact between brushes and commutators. Wiring must be cleaned, connections tightened, and all electrical equipment must be kept free of ice.

The distributor must be cleaned and points replaced and checked frequently. Spark plugs must be cleaned and adjusted and timing must not be unduly advanced or retarded.

Batteries must be kept fully charged, and care must be taken not to add water until the battery is to be put on charge, since added

water will stay at the top and freeze before it can mix with the acid, if the battery is not charging.

Brake bands have a tendency to bind when very cold. Vehicles should be parked with brakes released and wheels blocked instead.

Oil lubricated speedometer cables should be disconnected at the drive end when the temperature is below -30° , as they often fail to work properly and sometimes break due to excessive drag caused by the high viscosity of the oil with which they are lubricated.

Operation of vehicles on hard, frozen ground causes strain and jolting which may result in screws breaking or nuts jarring loose due to the fact that low temperatures greatly reduce the shock resistance of metals. Therefore, these items must be checked regularly.

Storage of fuel requires special attention also. Due to condensation of moisture from the air, water will accumulate in tanks, drums, and containers. At low temperatures this water will form ice crystals that will clog fuel lines and carburetor jets unless the fuel is strained. To prevent as much as pos-

sible the formation of ice in fuel containers, they should be kept as full as possible, since the more fuel there is in the tank, the smaller will be the volume of air from which moisture can be condensed. Addition of denatured alcohol to the fuel tank each time it is filled will reduce the hazard of ice formation. Closures of containers should be kept tight to prevent snow, ice, dirt, and other foreign matter from entering. Dispensing equipment must be kept clean.

There are many more important details covered in OFSB 6-11 with which you should be familiar, even to knowing that you should park a vehicle so it does not face into the wind, when there is no shelter available, so as to reduce chances of freezing. So remember to give your copy of OFSB 6-11 a good going over.

Meanwhile get your SB 9-16 and get busy! Give yourself plenty of time to get the requisitions through and the equipment on its way. And allow time for installation, too. After you've got your vehicles "winterized" there's one more important thing to do—see that the equipment is used!

Some Lessons From Sicily

Concluding remarks from "A Sicilian Diary" by Lieutenant Colonel A. Monro of The Queen's Own Cameron Highlanders, in *The Army Quarterly* (Great Britain) April 1944.

1. It is useless to attack a position unless you can be quite certain that you can get antitank guns up for consolidation within half an hour; or, if the attack is at night, by dawn.

The problem of positioning antitank guns in the dark is a difficult one. Tanks in hull-down positions are invaluable to cover the readjustments of antitank guns which are bound to be necessary at dawn.

2. In any sort of hard ground the entrenching tool is inadequate for consolidation. The extra burden of picks and shovels must be accepted, as it is the only way of being quite sure that the men have tools in their hands when they need them.

3. The large amount of machine guns

(Spandaus) and ammunition abandoned by the Germans on any position which they have held makes these an invaluable asset if our own troops are trained in their use.

4. The most difficult and dangerous time in any attack is the twenty minutes after the objective has been reached. Consolidation must be taught as a section and platoon battle-drill.

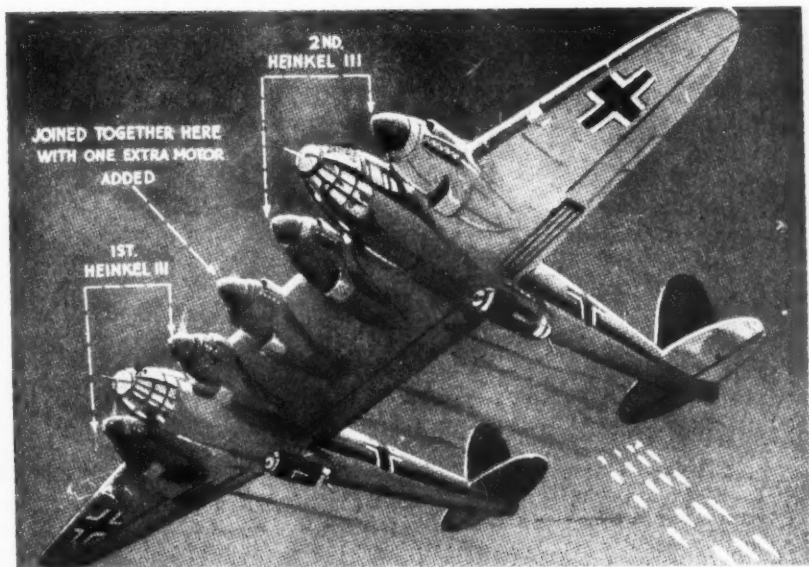
5. German snipers are taught that British officers carry only a pistol and are trained to search for personnel so armed and kill them.

6. Be very careful of surrendering Germans. There may be others behind who will shoot their surrendering comrades and you as well.

MILITARY NOTES

AROUND THE WORLD

GERMANY



A "Flying Monstrosity":

Two Mosquito pilots, flying in company on a deep penetration over a hundred miles south of Paris, suddenly saw before them what has been described as a "gigantic monstrosity," a Heinkel glider-tug, in effect two Heinkel 111's joined together by a huge main 'plane, and a fifth engine added, having two tails and two crew compartments. "It was the biggest thing I had ever seen in the air," said one of the RAF pilots. "At first I thought my eyes were playing tricks; then I

thought it must be two Fortresses flying wing-tip to wing-tip."

This Heinkel glider-tug confirms belief that the enemy has carried out an ingenious modification of this bomber. Both the Berlin radio and the Berlin correspondent of *Aftonbladet* have enlarged upon certain "surprise" new aircraft. They include a "new bomber" with twin fuselages which "looks like a Lightning fighter," and is probably no other than the two He 111's locked together as the He 111Z.

(*The Illustrated London News.*
Picture from the *London Sphere*)

Track-Wrecking Machine:

The following is a translation of the German account appearing under this picture: "Simple, yet highly effective is the operation of the track-wrecking machine which, at the instigation of Reichs Minister of Equipment and War Production Speer, was hurriedly devised and sent to the front, where it has given an excellent account of itself during occasional withdrawal movements on the eastern front and in southern Italy."

(Deutsche Allgemeine Zeitung)

Mines:

Some ingenious methods of killing Allied soldiers with mines have been used by the Germans in Italy. A spherical antipersonnel mine made of concrete represents one of the more recent developments. It is about ten inches in diameter and is loaded with shrapnel. This mine can be planted with trip wires running out in several directions. By reducing the explosive charge in the mine,

it can be used as a sort of grenade, the soldier rolling it down hill like a lethal bowling ball.

Another booby trap is a smoke cannister which is tripped with the usual wire. It has no morale or casualty effect itself but in daylight hours it lets German gunners know that there is movement going on and they can start lobbing shells in the direction of the smoke.

(Air Force)

Political Commissars in the German Army:

Political officers have been introduced into the German Army to keep up morale. Reporting the development, Reichs Marshal Hermann Goering's newspaper, the *National Zeitung* of Essen, said the title of the commissars would be "National Socialist Guidance Officers" (*Nationalsozialistischer Führungsoffizier*), abbreviated to NSFO. The Nazis' institution of political commissars was preceded by the appointment of an "inspector general for the training of future military leaders" with the German High Command, announced officially on 11 April by the German news agency.

(New York Times)

JAPAN*Paper Bomb:*

A grenade tossed occasionally from Japanese Dinahs at attacking planes is a rather odd device. It consists of a spherical container made of compressed paper with an open neck of compressed cardboard. Inside is a black, granular powder charge held in a silk bag, surrounded by high-explosive pellets. The black powder charge, fired by a pull igniter in the neck, bursts the container and scatters the high-explosive pellets, at the same time igniting the short fuzes on each. The pellets are made up of small metal cases containing high-explosive charges. Since there is little metal in the grenade, danger from fragmentation is negligible. The pellets could cause fire or blast damage if they make contact with a plane.

(Air Force)

U. S. S. R.

Russian Medical Achievements:

The People's Commissar of Health Protection stated that hospitals of the Red Army Medical Administration and of the People's Commissariat of Health Protection returned more than seventy percent of all wounded men to active service, a percentage which has remained constant throughout the war. The mortality in hospitals is much lower than that of the first World War, and in hospitals of the People's Commissariat of Health Protection it is a little more than one percent. Whereas more than sixty percent of those with wounds of the extremities during the first World War had to undergo amputations, the number of amputations in the present war has been reduced to one-third. The mortality among patients with chest, spine, face, and jaw wounds has been reduced from three to four times.

Russia has not had epidemics during this war, despite the extreme conditions created by the evacuation of populations, transport of troops, and the great scale of military operations. Isolated outbreaks of typhus were quickly suppressed. The number of cases of typhus during this period has hardly increased and there are fewer cases of dysentery, measles, and scarlet fever than during the prewar period. Specialized hospitals have been widely distributed, making it possible to correct defects which disfigure the face, to preserve eyesight, and to restore hearing and the functions of the extremities.

(Bulletin of the U. S. Army
Medical Department)

SPAIN

All-metal Wheels for Motor Cars:

Experiments are being made with an all-metal wheel for use with passenger cars and trucks. The experiments have been satisfactory. It has been possible to drive a fully loaded truck over a highway in bad condition at a speed of seventy kilometers per hour.

(Die Panzertruppe)

GREAT BRITAIN

A Modification of the Spitfire:

The famous Vickers Armstrong Supermarine Spitfire may now be seen with a variety of changeable features. Apart from carrying one or two radiators, and normal or pointed fins and rudders, the most important modifications are to be seen in the shape of the familiar elliptical wings. For low-altitude flying, the clipped-wing version is often used, and now in this new edition, the high-altitude fighter is equipped with extended wings for its work in the rarefied upper air.

(The Illustrated London News)

Moving Antiaircraft Heavies:

The big guns of the Antiaircraft Command weigh from ten to fifteen tons apiece. They are moved from place to place in Britain by the men of a Tractor Battery. To qualify for a place in one of these batteries a man must have long experience in driving heavy

vehicles and be an expert in map reading. Frequently it is impossible to turn around if a mistake has been made, owing to the width of the roads. Since its inception in July 1941, a Tractor Battery stationed in Scotland has traveled 300,000 miles, towing over 1,000 guns to various destinations. The Tractor Battery works with men of the REME [Royal Electrical and Mechanical Engineers] who are responsible for removing the more delicate parts of heavy anti-aircraft guns, which travel stored away in the tractor. Special transporters are used for removing static guns and the REME supply their own special tools for the job. The picture shows a gun-towing vehicle of a Tractor Battery pulling a 3.7-inch static gun mounted on transporter equipment.

(*The Sphere*, Great Britain)

Britain's Largest Armored Car:



The largest and most powerful British armored car that has yet seen service on any battlefield is the AEC Armored Car Mark II. It carries the new six-pounder antitank gun, in addition to a 7.92-mm Besa machine gun mounted coaxially with the six-pounder, and a light anti-aircraft machine gun on top of the turret. It has a maximum road speed of forty-two miles an hour. The armor is one and a quarter inches thick on the front and one inch at the sides.

(*The Illustrated London News*)

INDIA

India's War Effort:

India raised the peace time army of 182,000 to a mighty force of 2,000,000, all on a voluntary basis without any conscription or compulsory recruitment. Even today the recruitment continues at the rate of over 2,000 men per day.

India's achievements of industrial war production have been most gigantic, and on a scale which could not have been imagined a few years ago. Well over 1,500 work shops and forty munitions factories spread all over the country, directly employing 6,000,000 men, are today supplying in an endless stream war materials which they never did before: guns, shells, bombs, rifles, grenades, bayonets, explosives, armored vehicles, mine-sweepers, and countless items of equipment from batteries to parachutes. India's war plants today supply over ninety percent of the requirements of a modern army.

It is not perhaps realized that India is one of the largest industrial countries in the world. India turns out 5,000,000,000 yards of cloth every year and takes care of sixty percent of the total requirements of tents for the Allied Armies.

Indians are the largest army clothiers in the British Empire, and the largest steel producing unit in the British Empire is situated in India. Indians are also the largest manufacturers of army boots in the Empire, and Mr. Thomas Bata has a factory in India which alone produces 10,000,000 pairs of shoes every year.

(*Britain*, British Information Services)

SWITZERLAND

Antiaircraft and Antitank Weapons:

In frontier defense, in addition to the 7.54-mm machine guns on posts, 2-cm automatic anti-aircraft cannon, 3.4-cm automatic anti-aircraft cannon, and 7.5-cm Schneider anti-aircraft cannon are available. Two types of the 2-cm automatic anti-aircraft cannon are also available.

The infantry is supplied with 5.2-cm Traggreff mortars. They are muzzle-loading weapons and consist of tube and base plate with bipod support. The mortar weighs, in firing position, fourteen kilograms and forms a load for one man. The projectile has a weight of one kilogram and reaches a maximum range of 850 meters.

Oerlikon, a machine tool factory, has developed a 2-cm cannon which is employed in various ways. It serves not only in anti-aircraft and antitank defense but also for the armament of airplanes, as an antitank rifle, etc.

(*Artilleristische Rundschau*)

POLAND

Polish Forces with the United Nations:

General Sosnowski, Commander in Chief of the Polish forces, has revealed that besides two corps in Italy and Britain, Polish troops are now fighting with the British in the Burma campaign and Polish pilots have taken part with the American Air Force in the Chinese campaigns.

Besides more than 100,000 Polish men and women in the reconstituted Polish Army, Navy, and Air Force, General Sosnowski pointed to the still more numerous guerrilla army within Poland itself. This secret army was organized in regular units with a commander in chief and a general staff.

(*The Manchester Guardian Weekly*, Great Britain)

SWEDEN

Artillery Equipment:

The Swedish armed forces were equipped same time ago with Bofors M40 field guns. Sweden had the gun rebuilt for the 7-cm Swedish ammunition and later on again ordered guns of this kind. Also 10.5-cm M40 field howitzers were obtained from Bofors for the light field artillery.

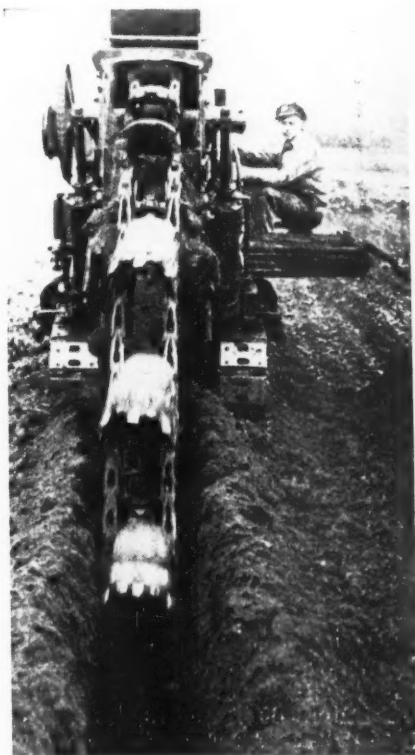
While up to 1936, the 10.5-cm gun was the main piece of the corps artillery, at the present time it is the long barreled 15-cm M39

howitzer. The 15-cm M37 cannon has been taken over by the coast artillery. In the future only the 7.5-cm M37 anti-aircraft cannon are to be purchased for use as medium heavy anti-aircraft weapons.

(*Artilleristische Rundschau*)

CANADA

A Trench-Digging Machine:



This trench-digging machine is now being used by the Canadian Army with great success. It can dig a trench five feet deep and 500 yards long in a full working day on suitable soil, and it is operated by only one man.

(*The Sphere*, Great Britain)

UNITED STATES

Battle Dress:

The battle dress shown in the photograph is reported to have had a splendid effect on the morale of the men who have worn it with the Fifth Army in Italy, and it is also now in use in Burma, Alaska, the Southwest



Pacific, Greenland, and England. It consists of dark green, water-repellant trousers with large pockets in each leg, a paratrooper-style half-length jacket with a drawstring inside instead of a belt, and four pockets, two high and two low. Buttons are on an inside flap to prevent their catching on objects while crawling. The material is a nine-ounce cotton fabric known as five harness sateen. The whole thing is worn over regular woolen trousers and shirt, and in very cold weather a pile fabric underjacket is added for warmth. The cap is made of

sateen fabric and the combat boots of flesh-side-out leather with a wide cuff at the top.

(*New York Times*.)

U. S. Signal Corps photo)

New Kit for Desalting Sea Water:

Sea water can be made safe to drink in twenty minutes, approximately a two-thirds cut in time from previous methods, with a compact chemical desalting kit which has been devised to meet the desperate needs of fliers forced down at sea and faced with death from thirst and dehydration. The kit is compact enough to be stowed in one-man rafts or parachute packs and is so simple to operate that a weakened or wounded man can quickly provide himself with drinking water. The complete equipment weighs less than four pounds, but with it a downed flier can convert fourteen pints of sea water into drinking water—enough to sustain life for two weeks.

(*U. S. Navy Magazine*)

Incendiary Bombs:

The M17 *aimable cluster* is the latest development in incendiary bomb-packing. Having a nose and tail like an ordinary bomb, it speeds earthward with precision. When the projectile reaches an altitude of about 5,000 feet, a primacord charge is exploded by a time fuze and the cluster breaks open to distribute its load over an area 300 feet in diameter.

Permitting far greater accuracy, particularly with the small two-pounders, the aimable cluster offers vast improvement over the earlier-devised cluster which opens automatically when released from the bomb bay and disperses its packages high above the target.

The aimable cluster carries 165 two-pound bombs, 110 four-pounders, or thirty-eight six-pounders. Some bombs in each cluster contain a small but lethal charge of TNT. Their delayed explosion discourages extinguishing attempts by the enemy.

(*Air Force*)

FOREIGN MILITARY DIGESTS

Modern Cavalry

Translated at the Command and General Staff School, from a Spanish article by
Lieutenant Colonel Marcial Vergara Guevara of the Chilean Army in
Memorial del Ejército de Chile July-August 1943.

THE claim was made by technical prophets that the war of 1914-1918 had spelled the end of the cavalry, and the campaign in Poland appeared to confirm this assertion. But Russia took it upon herself to reply to this, and today 250,000 cavalymen ride over the immense steppes of Russia fulfilling the most difficult of tasks, obtaining the best and most flattering results at a cost infinitely lower than that paid in the most minor mechanized operation. Provided with all the most modern equipment and with fire power based on its artillery, machine guns of all types, tank formations, and powerful aviation, the Russian cavalry has surpassed even the most daring hopes of its organizers and directors. While in the rest of Europe, motorization represented a substitute for cavalry, in Russia, cavalry was the arm which formed the complement of motorized formations.

German doctrine, revived in the present war, advocates again the employment of cavalry, and ordains that "cavalry should be employed in great masses and not in small formations. It should be equipped with the most modern weapons and specially trained to act in cooperation with tanks." This has served as a foundation in the Germans' revival of their cavalry. But the Russians already had many years start on them.

Here is an example of the Russian doctrine for the employment of cavalry:

"In the future, the cavalry will be assigned great tasks to fulfil. Large cavalry

units, powerfully supported by tanks, armored cars, and aviation, will have important operational and strategic missions: far-flung outflanking operations against the enemy, and the capture of important points, whether these be of strategic, economic, or political character, in addition to those tactical missions such as the disorganization and destruction of the routed and retreating enemy." It is the ancient employment of the cavalry in its purest form. The new feature is the material elements placed at its disposal; the old spirit of the arm remains immutable and eternal.

Krivoshein, the great Russian cavalry commander, writes in his book, which caused a sensation in Germany, the following: "As is the case with the cavalry, the pursuit of the routed enemy is one of the most fruitful missions of mechanized forces. The great mobility of the cavalry is complemented by the impetus and capacity for maneuver of the tanks, and, in this form, a mixed unit of cavalry and mechanized forces represents a highly efficient instrument of pursuit."

What has the cavalry lost, in the ultra-modern concept, with reference to its importance and efficacy? There is only one answer: It not only has lost nothing but it has again regained its position as an arm of primary importance for which there is no substitute in modern armies. But let us return to the Russian cavalry.

In the Soviet army, three main roles have

been assigned to the cavalry. First, it is used as strategic cavalry operating in large units such as divisions or corps and with the same missions that have been assigned to strategic cavalry since the times of antiquity. Secondly, it is used as a complementary arm with tank formations, cooperating with the latter; and, by virtue of its mobility and capacity for operating in any terrain, combined with its great fire power, it is called on for the exploitation of the breakthrough as soon as this has been effected. Lastly, its mission in minor units is in the rear of the enemy positions.

The present Red cavalry is the heir of ancient tradition and the natural product of a race of horsemen. Since the year 1919, the High Soviet Command has been engaged in perfecting this arm in all its aspects, espe-

cially as regards fire power. The cavalry has been increased during the whole course of the war and its training has never been relaxed for a moment. Special care has been given to the selection of commanders, all of them being young and endowed with those qualities that a cavalry commander should possess.

As can be seen from the long list of brilliant actions in which the Russian cavalry has had an important part, the cavalry has amply justified its existence, and the High Soviet Command has confirmed the fact that cavalry, generously endowed with all modern equipment and trained from times of peace in all its different missions, is an instrument of first magnitude for the achievement of victory.

The Salerno Landing

From an article by Major General F. A. M. B. Jenkins in *The Journal of the United Service Institution of India* January 1944.

THE landings were carried out by British and American troops, with the latter on the right. The river Sele was the dividing line. The object was, of course, the capture of Naples. As is well known, the operations were nearly a failure. The following are a few of the main reasons, some of them given to me by the commander of the British forces:

1. The "cover" plan did not operate as it did for the Sicilian landings. A "cover" plan is a deception plan; in other words, deceiving the enemy into thinking that the landings are to take place at some other place than that actually chosen. I was told that in the case of Sicily the Germans thought up to the last minute that we were going to land in Sardinia. This partly accounts for the weak opposition at Sicily. The whole operation was a brilliant piece of planning and execution on the part of the Royal Navy.

2. Our information was incomplete. We thought that the bulk of the German mobile troops were in the Naples area, whereas we found on landing that he had a complete

panzer division sitting in mobile reserve at Eboli.

3. During the approach to the beaches, the troops got to hear of the armistice with Italy. You can imagine the effect this had on troops all keyed up to land under fire. They thought it would now be a picnic.

4. The river Sele was an unfortunate choice as a dividing line between ourselves and the Americans. Being an obstacle to all MT [motor transport] movement, it made intercommunication at the critical stages of the battle extremely difficult.

Well, we eventually went to battle, and our success can to a certain extent be attributed to the following:

1. The cooperation of the Navy and Air Force. Early in 1943, when the 8th Indian Division was training in combined operations, naval gunnery was not considered sufficiently accurate to be of much value in the support of landings. Ideas have changed since then, and organized shoots now take place, controlled by naval FOO's [Forward Observation

Officers], who land with the assault troops and control the fire. The fire is still in the nature of area shooting, but it is now much more accurate, and the moral effect is great.

Terrific concentrations of fire were put down by our Navy at Salerno, and that, combined with the devastating effect of our "pattern" bombing called "Tedder's carpet," and to ground strafing of the German position, carried out with great determination and daring by our fighters, broke the morale of the Germans. Every available airplane in the Middle East and North Africa was turned on to the Salerno beaches. I have rarely seen, even during the late war in France, an area so pock-marked with shell and bomb craters.

2. The use by the Germans of their tanks in penny packets. At the battle of Alamein, von Thom was commanding in the absence of Rommel, who was in Europe on leave. The former used his tanks in small formations, as he had learned to do in Russia. By the

time Rommel got back, the damage had been done, and he found it extremely difficult to concentrate them in time to meet our tank thrusts. The same happened at Salerno. The German commander used his tanks in penny packets, with the result that although some broke through, they never broke through in sufficient strength to exploit their success.

3. Our chaps sticking it out. There comes a time in many battles when everything seems hopeless. We have fought ourselves to a standstill without result. Shelling and mortar fire is heavy, and we are suffering many casualties. It hardly seems worth while carrying on. And then suddenly the enemy starts to pull out, and success is ours. The battle of Keren was won by our sticking it out just a few hours longer than the enemy, and the same thing happened here. The corps commander said to me that he was amazed when the Germans started to pull out, as he really thought the battle lost.

Control of Large Tank Units in Offensive Operations

Translated for the Command and General Staff School from a Russian article by Colonel of the Guards, I. Shabarov, Soviet Army, in *Krasnaya Zvezda* 14 July 1943.

THE mobile character of modern warfare requires an unusually flexible and precise control of troops. This is especially true for tank units, characterized by the tremendous speed of their operations. It is very important to avoid lags in the swift tempo of the developing battle, and at the same time to maintain continuous control of tank units.

Despite the perfection which modern means of communication have attained, the basis of control still lies in the personal communication of decisions by the commander to his subordinates. It is a fallacy to think that modern tank battles make such personal contact very difficult, if not altogether impossible.

Our unit, participating in offensive operations in the south, covered about 600 kilometers in a month and a half of continuous clashes with the enemy. There were days

when our tanks traveled from sixty to seventy kilometers and participated in combat. During all this time only two methods of command were employed: personal contact of the commander with his subordinates, and radio transmissions. The headquarters worked with all possible speed. After receiving a combat order, they at once contacted unit commanders by radio. The commanders were told of the purpose of the call and the time for the accomplishment of their assignments. In their turn, the commanders, when setting out to receive their assignments from the senior commander, prepared their own staffs to receive orders and called in their own subordinate commanders. All this helped to observe time limits set for the preparations.

Let us consider the time elements in this method. Suppose that a unit commander is from two to three kilometers from the higher

headquarters. He can cover this distance in five or six minutes. Once there, he must familiarize himself with the decision and have some questions clarified. This will take from ten to fifteen minutes. His return will take another five or six minutes. Thus, a total of twenty to thirty minutes will be spent getting the combat order.

Much more time will be used if any other method is employed. Suppose the order is transmitted through staff personnel or liaison officers; ten to fifteen minutes will be spent getting familiarized with the decision; five or six minutes, in order to reach the unit; and fifteen to twenty minutes, to transmit it. Thus, a total of thirty-five to forty minutes will be required. It should not be overlooked that the use of such a method of control requires well trained staff workers and liaison officers, able to reproduce exactly the oral order of the commander.

These examples clearly show the advantages of personal communications. The economy of time is by no means the only one. It is just as important that a personal conversation enables the commander to explain his ideas in the best possible way. This will facilitate successful accomplishment of the mission when the subordinate commanders are confronted with an unexpected turn of events. Therefore, when new missions are assigned, personal contact with subordinate commanders is always preferable to a dry order on paper.

It goes without saying that all methods for directing tank and mechanized troops must be used in modern, highly mobile warfare. Radio, if used correctly, is the fastest. Only short and precise orders should be transmitted by radio. Orders taking on the volume of directives should not be allowed. Two-way radio conversation is almost as effective as personal contact. Such a conversation during a battle, if coded, will not give the enemy any additional information about the actions of our tank units. The enemy, however, will try to interfere. For example, during the battle for Rostov in the winter of 1943, the Germans assigned special radio stations for this purpose. These stations, having determined our

wave length and call letters, attempted transmission of their radiograms to our units. Therefore, call letters and wave length should be changed frequently.

During a battle involving a large tank or motorized unit the receipt and execution of the higher commander's orders must be frequently checked. This is the duty of staff personnel and liaison officers. The number of such staff officers working with the units should be limited, so as not to interfere with the command of the troops.

A few words should be said about liaison officers. They are often looked upon as regular messengers. Battle experience has shown, however, that they should possess high tactical qualifications. They should be able not only to transmit oral decisions of a higher commander coherently and clearly, but also, in case of need, to suggest to the unit commander the correct solution.

Sometimes wire communications are employed for the direction of tanks and mechanized units. This is done when a tank group is engaged in defensive battles or in the breakthrough of enemy defenses.

The command of units in marches is accomplished mainly by radio. Ordinarily, a large tank or motorized unit moves along several roads. Intervals between the columns differ and may amount to ten kilometers. A sufficient number of connecting roads will be required, if communications among the columns are to be maintained by messengers. Since such roads are often lacking, radio remains the only reliable means of command of the marching columns.

Some commanders fear that the enemy will locate their radio stations and then determine the deployment and intentions of their units. This fear is not well founded because radiogoniometry does not work well when radio stations shift rapidly, and if proper measures for radio security are observed it is almost impossible to locate the stations. It is necessary, for this reason, to operate with reduced output and to use proper call letters and code. Each column should have only one station assigned for transmissions to the higher commander. Thus

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there will be as many transmitting stations as there are columns in a moving tank group. The rest of the stations will be allowed to receive only.

In an offensive battle or in an action developing deep inside enemy defenses, the control of a large tank unit is accomplished primarily by radio or through staff and liaison officers.

Let us briefly touch on the question of the place of the staff and the tank group commander. For the sake of security and elasticity of control, they must be located under the protection of reserves and in the center of their battle formation.

In tank and motorized units, the operation staff group created for the control of units (with a limited number of staff officers) should send out a subgroup which acts as the first echelon of the operation group. In order

to feel the pulse of the battle directly, it must be located from one to one and a half kilometers behind the forward elements and must shift from one unit to another.

The forward echelon of the operation group should include the commander, the chief of staff, the chief of the operation section or his senior assistant, one assistant from the operation section, and an artillery officer. All of them must be in tanks equipped with radios. The second echelon of the operation group includes the rest of the staff workers and chiefs of services, and is located from two to three kilometers from the forward units. It exercises control of the unit as a whole, gathers information from reconnaissance units, and maintains contact with neighboring and higher staffs. The advisability of such a disposition of staff elements has been proved under battle conditions.

The War in the Air, 1940-44

Digested at the Command and General Staff School from an article by Marshal of the RAF Sir E. Ellington, in *The Army Quarterly* (Great Britain) April 1944.

IT MAY be of some interest to examine how, in the development of the air war during the last three and a half years, the defense has gained over the attack or vice versa. In the Battle of Britain the losses inflicted on the German Air Force by day are understood to have been ten percent, and 2,181 enemy aircraft were claimed to have been destroyed between the 8th of August and the 5th of October, so that in this period the Germans probably made over 22,000 sorties against the United Kingdom. The average number of sorties is believed to have been about 400 a day, and the greatest number in one day 900 when our fighters made 899 sorties to deal with them. This effort of the enemy was made by a force of some 1,500 bombers and 1,000 fighters, to meet which the RAF should have had some 800 fighters if all squadrons were up to establishment and ready to operate. It is of interest to note that on an occasion recently, British and American aircraft made

3,000 sorties over the continent between dawn and dusk on a winter day. Between the 11th of August 1942 and the 27th of January 1944 the Eighth U. S. AAF lost 1,130 bombers, said to be about four percent, so that in this period some 28,000 sorties were flown by day. Since the American attacks included such deep penetrations into Germany as the bombing of Brunswick, Schweinfurt, Kiel, Maklam, and Marienburg, the period of exposure to enemy attacks must have averaged much longer than in the case of the German attacks from across the Channel on this country in 1940. The risk of loss, therefore, has lessened in the last three and a half years by more than the difference represented by a drop of from ten to four percent. This would suggest that by day the attack is gaining on the defense. This is contrary to the experience of the past, for it has usually happened that the introduction of a new weapon is followed by its antidote, and that the defense

generally gains over the attack once the element of surprise has lapsed. However, this may be the wrong way to look at the matter, for it may be that it is the defense of the bomber which has gained over the attack by the fighter. In the Battle of Britain the eight-gun fighter was devastating against the badly-armed German bomber once it had been brought to action, and radar was of much assistance in interception, whereas in 1942-3 the well armed United States bombers had a much more effective defense than their predecessors of 1940. Further, the high ceiling of the Fortresses and Liberators, together with the improved technique of bombing through clouds, has enabled bombing to be carried out even in bad weather and at such a height as to reduce the risk of damage by antiaircraft fire to an acceptable degree. The latest development in the tactics of defense is the rocket used from enemy aircraft; this is being countered by escorting the bomber by fighters throughout the fight. For this, the range of fighters has been increased, but even so the reach of the day bombers has been restricted to the radius of the fighter, a measure of success for the defense. The latest long-range fighter is the Mustang with the Rolls-Royce Merlin engine built by Packard.

By night, during the autumn and winter of 1940 and the spring of 1941, the heavy German attacks on this country, made in a maximum strength of 450 in any one night, were carried out with small loss due to our defenses, though it is probable that the loss due to weather and insufficient training was high;

and by May 1941 our fighters were taking an encouraging toll. In the last three years this increase has continued, and in the small-scale raiding on this country recently, the average loss must be as much as ten percent of the aircraft to cross our coasts; indeed, on the night of 21-22 January it was as much as sixteen percent. In this connection, it must be realized that the big bomber is more easily and earlier seen by the attacking fighters than vice versa, a fact which makes the improvement of the night bomber's defenses far more difficult than that of the day bomber.

As regards the experience of our night bombers over Germany, the losses are said to be a lower percentage than three years ago, and under five, while the bomb load has very greatly increased. This favorable comparison with the enemy's loss is probably due to the great numbers used for a concentrated attack in a short time, first put into operation in the 1,000-aircraft raid on Cologne in 1942. These tactics, by swamping the antiaircraft defense, which incidentally deprives the fighters of the assistance of searchlights, have greatly weakened the defense. Further, the use of pathfinders has enabled attacks to be made in cloudy weather, thus adding to the difficulties of the defense. To sum up, it would seem that the attack has gained over the defense by day during the last three and a half years, while at night the defense has gained some advantage. The latter is probably due to the fact that whereas by 1940 defense by day had reached a moderate degree of efficiency, defense by night was in an early stage of development.

Some German Reconnaissance Methods

Translated and digested at the Command and General Staff School from a Russian article by Major A. Atzarkin in *Voyennyy Vestnik* (Military Journal) September 1943.

HAVING received a reconnaissance mission, a German company or battalion commander puts his reconnaissance groups through a series of training exercises (creeping and crawling, surmounting obstacles, moving

noiselessly, etc). Not infrequently, such groups are moved into the rear areas for this purpose. At the same time, other small reconnaissance groups crawl out beyond their forward edge and conduct observation of our

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position, especially that part of it which has been designated for the reconnaissance mission. There have been cases when such preparations continued for two or three weeks.

The Germans always conduct thorough observation before reconnaissance sorties are undertaken. The following example characterizes their tactics.

Preparations began about a week before the operation. The company commander, having selected a number of his most reliable men, trained them in the rear, near the battalion headquarters. A few days before the action, the sappers had made several passages through the minefield. The passages were one meter wide. Every night the passages were blocked by portable mines. The reconnaissance group, which consisted of thirty-seven men, was split into three subgroups, each of which, although supporting the others, acted independently. The mission of the group was this: to get through the prepared passages, to assemble before the ob-

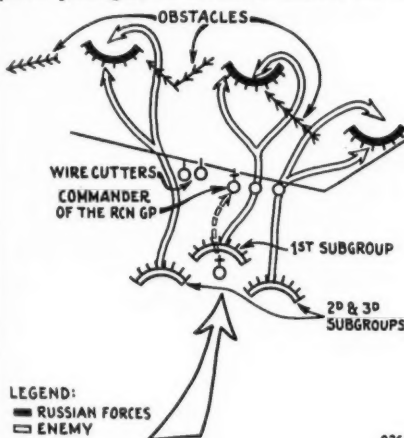


FIGURE 1.

INDEPENDENT ACTIONS BY THE SUBGROUPS.

structions (earth), to rush toward the emplacements (each subgroup taking care of its assigned emplacement) after the obstacles were blown up by the sappers, to capture prisoners, and to withdraw quickly (Figure 1).

The formation and tactics of another group observed on our sector were somewhat different. This group was composed of a commander, two sapper-observers, a radio operator, an assault subgroup (ten men), two security (support) subgroups (each of five

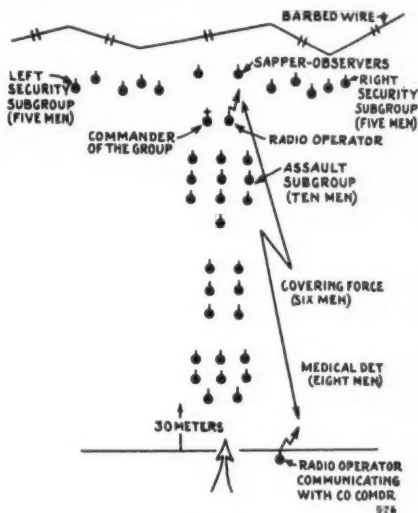


FIGURE 2.

BATTLE FORMATION OF THE RECONNAISSANCE GROUP DURING THE FIRST PHASE WHEN APPROACHING THE FORWARD EDGE.

men), a covering party (six men), and a medical detachment (eight men). The scouts approached their objective in the order shown in Figure 2. The security subgroups moved in line with the sapper-observers. Having penetrated our forward edge, the assault group split into two parties (Figure 3) and moved toward the two adjacent emplacements trying to assault them from the rear. The sapper-observers, having made the passages for the assault subgroup, came out on the forward edge and, being somewhere between the assault and security subgroups, conducted observation.

The security subgroups are usually found on both sides of the commander (not over twenty meters from him). The covering force is behind the commander twenty meters, with the medical detachment in the rear of the

covering force. Thus, the total depth of the formation is about 180-200 meters. The withdrawal is effected in the same order.

The action of the group is usually supported by artillery and mortar fires. These fires, in addition to suppressing our emplace-

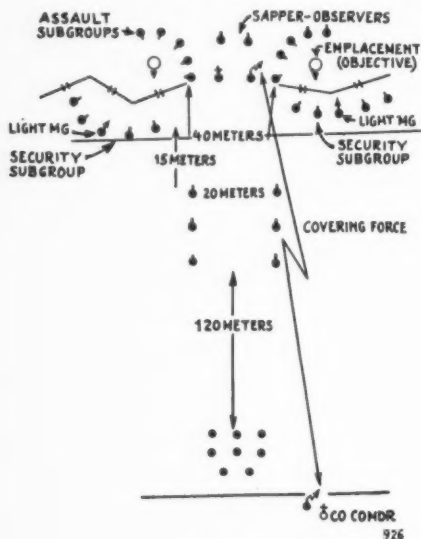


FIGURE 3.

THE RECONNAISSANCE GROUP IN BATTLE FORMATION DURING THE SECOND PHASE OF THE ASSAULT.

ments, make passages in minefields and other obstacles, and leave, in the neutral zone, shell-craters to be used as cover by their men. To confuse us, artillery and mortar fires are often conducted on a broad front, but as soon as the group reaches the objective, the fires are transferred into the depth, or ring the area where the reconnaissance is being conducted.

Another method often used by the Germans is massed artillery and mortar preparation fires for about fifteen or twenty minutes, followed by the action of the reconnaissance elements. Sometimes the artillery preparation lasts longer. When the small groups fail to achieve any results, artillery preparation may last as long as an hour and a half and a

whole company may be used for the reconnaissance mission.

Here are a few examples of cooperation of German reconnaissance groups with the artillery.

At one time, the Germans opened methodical artillery and mortar fires. We knew that they had made several passages in the minefields bordering on our forward edge. Several observers were noticed, and on the following day about thirty Germans with submachine guns and carrying bundles (probably camouflage robes) approached our forward edge and then dispersed. The movement of the personnel in the German position increased.

During the day and until midnight the German guns and mortars were inactive. But at 2400 the enemy opened a strong and methodical fire. Under the cover of this fire, the reconnaissance group surmounted the obstacles and began crawling toward their objective. At 0235 they released three red rockets. The fire grew in intensity. The roar of artillery was supplemented by the rattle of rifles and machine guns. To confuse us, the Germans took under artillery fire a sector one and a half kilometers wide. We saw, however, where the main forces of the enemy were concentrated (targets for our infantry were indicated by tracer bullets). The artillery preparation lasted about fifteen minutes. When one red and two white rockets were released, the fires were transferred to form a protective barrage around their objective. At the same time, the reconnaissance group of thirty men broke into our position. The assault subgroup was ahead of it (six or seven men) while the security subgroups (five or six men in each) protected the flanks.

Having been repelled by the garrison of our emplacement, the group began withdrawing. The security subgroups followed it, conducting intense submachine-gun and machine-gun fires. The artillery fire was then transferred to the emplacement in order to cover the withdrawal.

To confuse us and to dissipate the attention of our defenders, a demonstration of a

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reconnaissance-in-force action was staged a little to the south of the actual operation.

This example shows that the Germans pay most attention to the organization of the co-operation between the artillery and the reconnaissance elements. It also emphasizes the fact that they try to reach their objective in the shortest possible time right after the supporting fires are transferred to the depth of our defense.

Here is another example: Beginning at 0515, the enemy shelled our forward edge for twenty minutes, using 150-mm and 105-mm guns. At that time the fire was sud-

denly transferred to the adjacent sector in order to confuse us, after which it was again directed at the first objective. Then absolute silence fell over the front. Soon afterwards, to create the impression of an attack by large forces, we were subjected to the fire of six-barreled mortars and infantry cannon. The fire centered over the depth of our position. During this time a company of Germans attacked a number of our firing emplacements, and the artillery transferred its fire to the flanks of the attacked emplacements. Knowing the German technique, our men repelled the attack.

Leadership

Digested at the Command and General Staff School from an article by Major General M. J. Costello in *An Cosantóir* (Eire) February 1944.

AN army is as good as its leaders. An analysis of the "ups and downs" of any unit over a period of years will show that the unit is made or marred by those whose example is the most powerful influence on the men and whose orders and teaching direct their activities; that is, by its leaders.

"In war," said Napoleon, "The Commander is everything . . . The Gauls were not conquered by the Roman Legions but by Caesar. It was not before the Carthaginian soldiers that Rome was made to tremble but before Hannibal. It was not the Macedonian phalanx which penetrated India but Alexander." Foch, a century later, said: "History is right in making generals responsible for victories—in which case they are glorified; and for defeats, in which case they are disgraced."

It is not only because he orders and advises those under him that the leader is of paramount importance in a military unit, but also because the influence of his example moulds the character of his men. One of the powerful influences upon human nature is the tendency to imitate, to act as we see others acting. Every leader worthy of the name is bound to have a powerful influence in this way, merely by the virtue of his position of authority. The example of one to whom all

eyes are turned is bound to be especially effective. The character of his unit will "sooner or later become the reflex of his own; from him the officers take their tone; his energy or his inactivity, his firmness or vacillation, are rapidly communicated to the lower ranks; and so far-reaching is the influence of the leader that those who record his campaigns concern themselves but little as a rule with the men who followed him."

The effectiveness with which the commander of an army or a battalion can lead his command depends not only upon his own character, intelligence, and energy but also upon the quality and the loyalty of his subordinate commanders.

Selection of Leaders

Since the leader is of such great importance, one of the most serious of all duties in the administration of an army is that of selecting leaders. The selection of the leader for a section is just as important for that section as is the selection of the commander in chief for the whole army. The corporal is a leader, too, just as much as the general, and if his scope is much more limited and his responsibilities correspondingly less, his po-

tentialities for good or ill are just as great within his own sphere.

Every army officer who has any power or influence in the appointment of leaders wields a power or influence which has far-reaching consequences for good or ill on the unit affected. Most officers have this power and the responsibility which goes with it. While the selection of the higher commanders is properly and necessarily a matter for the Government, the selection of all others is in the hands of the army leaders themselves.

For good or ill, the selection of the leaders of our armed forces is in our own hands. If the selection is unwise we must blame ourselves. The selection is not always wise. There is no such thing as human infallibility, nor is there any such thing as the perfect human being. Our leaders must be selected from human material, that is to say, imperfect material; from the best material available, not from that which is ideal. And the selectors are subject to the errors and misjudgment which are the lot of all humans.

But it is obviously necessary that the army officer who selects or recommends the appointment of a leader should strive to select the best available man. It follows that he should give careful thought to the matter, that he should make certain that he knows the kind of man he wants, and, which is more difficult, he should make a conscientious effort to know the character and capacity of each individual whom he considers for promotion or appointment.

I am afraid that it must be said of some selections for positions of command that the selector acts in a somewhat haphazard way or without a sound basis of facts upon which to form his judgment. The inevitable result is that we find ourselves from time to time with leaders *who cannot lead*. A leader who cannot lead is worse than a nullity. Without an effective leader any military unit, however small, reverts to a state of bewilderment or apathy or anarchy. If its members are men of strong character, there will arise an unofficial leader who may not be by any means the best guide, or a number of rival would-be leaders emerge, making the unit a

hydra-headed monster. And furthermore, the ineffectiveness of the leader cuts off, instead of amplifying and adapting to local conditions, the current of orders and influence from higher authority.

It is not surprising, therefore, that, in the words of General Robert E. Lee, "the general remedy for want of success in a military commander is his removal." But the act of removing any leader is a serious one. It is bound to have some disturbing consequences upon the morale and discipline of the unit, unless some particularly worthless individual has by some chance attained to a position of leadership. The safety and well-being of the many does, however, demand the sacrifice of the few, and it therefore becomes the unpleasant duty of superior authority to replace the unsuccessful leader when his want of success is proved. Failure to do so invites disaster. The more careful and intelligent is the choice of leaders, the less often will arise this unpleasant necessity with its consequences in friction.

The man or men who have the power of selecting the leaders of a military unit have the power of moulding its character in the most decisive manner. It is seldom that any commander is so fortunate as to be able to choose all his own subordinate commanders. He must in many cases take those given to him or those already appointed before he takes command. But every commander has the responsibility of making selections or recommendations for promotion and for filling vacancies which occur in the lower grades of his command. Our officers and NCO's are found from within the ranks of the army, so that the selection of all future officers and NCO's originates with some commanding officer, if not the commander of the unit to which these new leaders are first appointed.

All Officers and NCO's Are Not Leaders

There are many essential administrative and staff appointments in the army the holders of which are not called upon to exercise the art of leadership. The qualities which make a good company quartermaster sergeant, orderly-room sergeant, or the intelli-

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gence officer of a large unit, for example, are not necessarily those required for command.

In selecting and appointing officers and NCO's we must therefore be careful to distinguish between those who are leaders and those who are better adapted by nature for the difficult and important staff duties upon the efficient performance of which the leader and his troops alike depend for their success, and even their continued existence as a military unit.

A man is not by any means unsuitable for promotion to officer or NCO rank because he does not happen to be a leader.

"By Their Fruits Ye Shall Know Them"

The surest basis of selection of leaders is obviously the consideration of the past performance of the candidates. If a man has failed to lead a section it would be criminal to place him in command of a platoon. If a man is not himself a good soldier, and indeed a better soldier than his comrades, he is certainly unfitted to lead them. The most important qualification for promotion, the one which transcends all others, is therefore that the candidate shall have shown outstanding merit in his present rank. Judgment on this point should be made on a careful consideration of the performance of all duties, and not merely upon the brilliant performance of one or two. Still less should judgment be based upon a vague general impression. It is the business of the immediate superior or the person passing judgment to know definitely how good a soldier is at shooting, marching, digging, fieldcraft, at looking after his clothing and equipment, how strong is his spirit of discipline, and how great his enthusiasm and energy, before he signs a recommendation for the promotion of that soldier.

Qualities required of different ranks vary, but each rank must be clearly the superior of the next lower.

While no man who is not a good private soldier can hope to be a good corporal, it does not necessarily follow that all good private soldiers would make good section leaders. No one would suggest that excellence as a corporal is a proof of fitness to command a bat-

talion. The proof of success in the present rank, which is the first qualifying test for promotion, is a practical and easily applied test, but it must be followed by others. We must find out if the candidate has the qualities required in the higher rank.

A leader should himself be able to do every job which falls to the lot of his immediate subordinates. He leads more easily by example than by exhortation, so he must himself be whatever he would desire his subordinates to be. The corporal must be able to set an example to his men in discipline, endurance of hardships, skill at arms, fieldcraft, and the other skills of the soldier. The captain must be able to command a platoon at least as well as any of his lieutenants. He does not necessarily have to maintain the same skill as, for example, his range-finders and scouts, but he must know their duties so well that he can detect faults and judge performances. The battalion commander should be at least as well able to command any of his companies as his company commanders. The brigade commander must be capable of doing not only the job of his battalion commanders but of each of the commanders of the other arms in his formation. He does not need the specialized knowledge which enables the artillery commander, the signals officer, and medical officer to train or supervise the training of *their* subordinates. He does not require to be able to perform an operation like a surgeon, but he must understand the work of each of his subordinate units well enough to give the necessary orders to it. He should, for example, be as well able as his medical officer to issue the combat orders of a field ambulance.

As we ascend the scale of ranks we call for ever higher intellectual powers and wider knowledge. The necessity for superior manual dexterity diminishes in importance, and while the colonel must be able to endure all the hardships of his men and display powers of endurance equal to the best, he does not require to be able to cross obstacles with the assault platoon or march on foot for the same distances.

Thus far it is argued that the knowledge,

skill, and powers of endurance of the leader must be equal to the performance of the task of each of his subordinates except in so far as specialists like surgeons are concerned.

But this is not enough.

In every leader we must have a clearly established and fully acknowledged superiority over those under his command. Without this acknowledged superiority over his subordinates the leader cannot expect that confidence and loyalty which are necessary to him in the discharge of his responsibilities.

In what should this superiority of the leader consist? In every case it should ideally show itself in a stronger character. It should also be evident in a wider knowledge. In the junior ranks it should be manifest in a superior skill at arms and tactical skill, or in the case of specialist troops in superior technical skill. In the higher grades it should include intellectual superiority corresponding to the wider ranges of knowledge and greater powers of comprehension required. In the higher ranks also the superiority of character should be manifest in qualities such as fortitude and

moral courage of a high order which are not necessarily indispensable in a good corporal.

Battlefield or Barrack Square?

If we were concerned with maintaining the army as an institution merely for peace-time activities the selection of leaders would be much easier than in fact it is. But an army justifies itself only on the battlefield. We want only those leaders who will be a success in battle. It is on the battlefield that any weakness in leadership will have its most far-reaching and disastrous effects. The strain of battle will disclose weaknesses which may not be apparent in peace time, and defects which can be overcome or which may be overlooked in garrison life will quickly become apparent under the stress of war.

It is in times like these that men feel most acutely the need for leadership. Those who have had battle experience will recollect the powerful impression made by men who displayed powers of leadership in battle, men whose courage and fortitude were the property of those around them.

Guerrilla Attacks on Populated Places

Extracts from the Soviet *Handbook of the Guerrilla*, 3d edition, 1942.

These extracts pertain to the operations of Russian guerrillas only. The guerrillas attack populated places in order to destroy German personnel and equipment, to replenish their own equipment and supplies, and to take prisoners. When this mission is accomplished, they withdraw. For this reason, the treatment of organization and consolidation of the position following its occupation is somewhat sketchy in this article.
—THE EDITOR.

OF ALL operations conducted by guerrillas, attacking a populated place is the most difficult. The enemy troops which will have to be overcome will be composed not only of detachments guarding the headquarters, but also of special signal, intelligence, and other units.

All populated points occupied by the enemy are more or less prepared for defense. Their approaches and outskirts are studded with various obstacles, trenches, and pill-boxes. Individual houses are made into fire nests, from which fire can be laid down on the streets and squares, which, moreover, will be subjected to artillery, mortar, and machine-gun fire from previously prepared positions in adjacent areas.

In most cases, adjacent Fascist garrisons maintain wire or radio communication. This enables them to call for and quickly receive reinforcements.

The layout of the locality should be known in detail. This means familiarity with the location of streets, squares, and individual buildings. Every guerrilla should be able to orient himself with ease, and to draw a de-

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tailed plan of the populated place with all the enemy objectives to be attacked. It is advisable to inspect these objectives personally. It is important to know which buildings are made of stone or wood and what service units or headquarters they house. Study the shortest ways of getting from one objective to another.

Reconnoiter and then determine how the garrison is quartered: its total strength; number of men guarding individual objectives; location of officers', staff officers', and administrative officials' quarters. Also learn how the Germans are armed and how often and when they change guards and sentinels and send out patrols.

Determine the character of their defenses: the system of obstacles; the location of firing positions; the degree to which individual buildings have been adapted for defense. Have the windows been reinforced? Are there basements, shelters, and cellars which the Germans can utilize for defense? Check whether or not there are barricades and trenches on the streets and squares.

Carefully study the approaches to the locality. Determine how to reach the enemy objectives most speedily and with minimum losses. To do this, first learn which sectors contain the greatest number of artificial obstacles; which firing position can open fire on the approaches and should therefore be destroyed first; the location of minefields and how they can be by-passed. If in the vicinity of the locality there is a river or a swamp, determine the possibility of crossing it in secrecy in order to make a surprise attack on the chosen objectives.

Reconnoiter continuously. Clarify and check all information obtained previously.

Always remember that surprise and initiative are the main conditions determining success of attack on a populated locality. Strike the enemy where he least expects you.

Night is the best time to attack a populated place. Fog, heavy snowfall, and generally inclement weather conditions are good for staging a raid. Night time is preferable, however. Only at night can the maximum effect of surprise be attained. But action at night

calls for careful preparation. Every guerrilla must know his exact mission; to what group he is attached; what objectives he is to destroy and by what means. Guerrillas belonging in the same group should be able to recognize each other. For recognition in darkness, white bands may be worn on headgear or sleeves. A password or a sign should be agreed upon. Furthermore, every guerrilla should know the established sound and light signals for attack and withdrawal. It is very important that these signals be radically different from those used by the enemy. Know your assembly point which you should reach after a withdrawal.

Success can be achieved by a simultaneous attack from several directions. At one and the same time, the guerrillas attack both the Fascist troops located in different parts of the locality and the most important objectives. If you lack sufficient forces to do this, then first annihilate the enemy troops and later destroy the various objectives. Destroy enemy troops where you find them; do not give them a chance to join forces. Cut all their avenues of retreat.

A populated locality occupied and defended by the enemy may be attacked in the following order. The leading groups of guerrillas either noiselessly eliminate the outposts or by-pass them. Then they suddenly attack firing positions, pillboxes, and trenches. They smash the enemy troops on the outer ring of the locality, destroy their weapons, ammunition, and lines of communication.

All this will prepare the ground for the second guerrilla group, which quickly reaches the most important objectives, destroys the bulk of the enemy manpower, overcomes the guards protecting these objectives, and captures prisoners, weapons, documents, correspondence, etc. It is important to attack different objectives simultaneously and with dash and boldness. Make good use of all your weapons. This creates an impression that your forces are greater than they really are. Strive to surround your objective from all sides and maintain pressure until it is completely destroyed.

The groups whose mission is to destroy cer-

tain selected objectives should expect stubborn resistance and sometimes organized counterattacks. In order to meet this threat, the guerrillas designate a number of fighters as a reserve.

Simultaneously with taking up the initial positions for an attack on a populated point, the guerrillas send out a number of patrols. This is done to prevent the Fascists from fleeing the locality and to repulse enemy reinforcements arriving from adjacent places. Guerrilla patrols are placed wherever the enemy is most likely to counterattack. Paired sentinels are sent out in all directions and stationed at distances which permit visual communication. Thus the populated point is completely isolated for the duration of the operation. Another duty of the patrols is the detention of all inhabitants attempting to leave the locality.

When an attack on a populated point is executed, it is essential to set up reliable communication between the various guerrilla groups and the commander in charge of the whole operation. Because of the quick tempo of action, it is very difficult to use technical means of communication. Therefore, each guerrilla group, including reserves and patrols, has messengers who carry all reports and orders.

The enemy may attempt to resort to street fighting. That is why small guerrilla groups (two or three men) are detailed from the assault group to seize at once all enemy trenches and barricades inside the populated point, thus preventing the Fascists from using these structures for street fighting.

The first duty of the reserves is to join street fighting. They are later reinforced by the guerrillas who have completed the destruction of secondary objectives, auxiliary services, transport, etc. In cases of extreme emergency, even signalmen join the fighting. A number of guerrillas specializing in the destruction of tanks and a group of machine gunners are attached to the reserve group. Some of the machine guns should be used for firing along the streets and squares. The re-

serve group should be prepared to use incendiaries and explosives in order to destroy buildings from which the enemy offers stiff resistance.

Remember the basic rules of street fighting. Very often, the enemy barricades himself in buildings: in basements converted into pillboxes, in upper floors, near attic windows, and behind chimneys. The enemy also fires at intersections from corner buildings. He sets up firing positions in backyards, gardens, and vegetable plots.

Avoid movements and halts on squares and in the middle of broad streets. Cling to houses. Hide behind their extensions, entrances, and columns. Direct machine-gun fire at the houses occupied by the enemy. Throw into them fragmentation and antitank grenades. Burn the wooden houses. Blow up the buildings where the Fascists have barricaded themselves. In street fighting, sub-machine guns and grenades are very useful. Be brave, quick on the trigger, and resourceful.

Reconnaissance should be carried on during the whole operation in order to warn the commander of the guerrillas of the approach of enemy reinforcements.

If the guerrillas' mission involves holding the locality, the operation should be conducted as follows: The detachments guarding the locality remain in their places and dig in. The reserve group occupies the enemy defense structures on the outskirts, making them fit for defense. The other groups mop up the remnants of the Fascist garrisons and administration, collect captured weapons, ammunition, and equipment, and put out the fires. Guerrilla scouts report actions and intentions of the enemy in the adjacent areas.

Sudden attacks and great mobility are the basis of all guerrilla operations. Therefore, it is not to the advantage of the guerrillas to get involved in prolonged battles; the enemy will have time to bring up reinforcements. Unless specifically authorized, avoid long defensive battles.

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Notes on Jungle Warfare

From a restricted source applying chiefly to southeastern Asia.

IN principle there is nothing new in jungle warfare, but the environment of the jungle is new to many of our troops. Special training is therefore necessary to accustom them to jungle conditions and to teach them jungle methods.

Woodcraft, silent movement, concealment, deception, keen eyesight and hearing, and above all good marksmanship and superb physical fitness are the requisites of jungle fighting.

Experience shows that command must be decentralized so that junior leaders will be confronted with situations in which they must make decisions and act without delay on their own responsibility. The ability to make sound decisions can only follow from thorough training and continuous practice.

Since both jungle fighting and night fighting are characterized by limited vision and difficulties of maintaining control and direction, they have much in common with each other. If, therefore, units are unable to train under jungle conditions, a high standard of night training must be achieved and will prove to be an excellent preparation for jungle training.

Jungle country varies from forests to mountainous jungle and the more open coastal and cultivated areas.

The features common to all jungle areas are scarcity of tracks, limited visibility for both air and ground forces, and difficulties of cross-country movement by all vehicles.

In general, there are three types of jungle: primary, secondary, and coastal. Primary jungle is natural vegetation which has never been touched and has remained in its original state. Visibility is limited to twenty to thirty yards, varying according to the slope of the ground and amount of foliage present. On the tops of hills the foliage is thin and in valleys it is extremely dense. Where there is a stream which has become blocked, a swamp is often formed and this is sometimes impassable; but these swamps

generally extend only for a few hundred yards and can always be circumvented. Tracks exist, but they are seldom shown on maps. The jungle is never impassable to infantry at any place, although a dah, kukri, or machete is necessary to cut new tracks or to remove undergrowth. The smaller the party, the more rapid the advance.

Secondary jungle occurs where the primary jungle has been cleared and allowed to grow up again. The vegetation usually takes the form of very dense ferns and brambles through which it is impossible to force a way without some form of cutting instrument.

Along the coastal areas, the jungle often becomes more open, and consists of mangrove swamps and clearings of Kunai grass. Kunai grass grows to a height of four to eight feet, which precludes ground observation. In addition, there are coconut groves near inhabited areas.

Rivers in low country are generally broad and sluggish, but in the hills are deep and swift. They are no obstacle to determined, ingenious troops.

Paddy fields are very difficult going in the rainy season, but, although a man may sink knee-deep in mud, they are no real obstacle to hardy troops. In the dry season, except for the little "bands," they are good going, but are hard on all vehicles, even though tracked.

Rubber plantations vary according to their age; when young, they give cover similar to a field of potatoes. When mature, the symmetrical lines allow up to two hundred yards ground visibility and give fair cover from the air.

Full-grown tea bushes give good cover for men but are never big enough to hide vehicles, guns, or animals.

Jungle almost invariably means great humidity and high rainfall; also many streams and swamps, with attendant disadvantages and discomforts such as mosquitoes and malaria, leeches, chills, etc.

The constant object must be to exploit the special features of the country to our advantage by developing tactics suited to the particular conditions; and, by training and knowledge of jungle craft, to minimize the physical discomforts.

The term jungle craft implies the ability of a soldier to live and fight in the jungle; to be able to move from point to point and arrive at his objective fit to fight; to use ground and vegetation to the best advantage; and be able to "melt" into the jungle either by freezing or intelligent use of camouflage; to recognize and be able to use native foods; and possess the ability to erect rapidly temporary shelters to ward off tropical downpours. A jungle soldier should be sufficiently well versed in jungle lore to recognize instantly the cry or call of disturbed birds. His ear should be attuned to normal jungle noises in order that he may detect foreign or man-made sounds. He must learn to rely on his observation of broken twigs and branches, of trampled undergrowth and of disturbed mould, to detect the recent presence or proximity of humans. He must use his sense of smell (it is a curious fact, but the Jap soldier possesses a peculiar, unpleasant odor which is most persistent). He must readily recognize the danger of tracks converging at either watering places or gardens, and approach such areas with caution. He must learn to move through the jungle in darkness and be able to retrace his steps. He must learn to move silently, to avoid stepping on rotting logs and twigs and otherwise giving away his presence to the enemy. In short, the jungle is the home of the jungle soldier, and the sooner he learns to feel at home there the better.

In the succeeding paragraphs, the conditions envisaged are those of jungle in which the outstanding characteristic is *lack of visibility*.

It will help to understand the principles of operations in this type of country if they are thought of as night operations. There is the same emphasis on the *supreme* importance of control, with consequent reduction in distances and intervals; the same

need for limited objectives; the same difficulty in keeping direction; the same difficulty of using covering fire; the same reliance upon the ear rather than the eye, and the consequent need for absolute silence.

Night operations are normally undertaken to surprise the enemy by making use of poor visibility to obtain cover from view. In jungle fighting similar conditions prevail and the jungle must therefore be regarded as a friendly cloak, which enables infantry to close unobserved with the enemy and, therefore, the more easily to kill him.

Since jungle so favors the attacker, a purely passive defense in the jungle is doomed to disaster and must not be tolerated.

Defensive measures will, however, be necessary for consolidation, when at rest to deny an area to the enemy, or to provide a firm base for further offensive operations.

The measures adopted will vary according to the task and circumstances of the force. When a force is dependent upon a land line of communications, it will be necessary to protect the line of communications by a series of defended perimeters, which will act as the firm bases from which counteroffensive and counterattack troops will operate and within which other troops may rest, transport may harbor, and reserves of supplies, petrol, and ammunition may be built up and maintained.

In the case of detached forces operating for a short period and carrying their own supplies, or for long periods and supplied by air, the necessity for the protection of the line of communications is of little importance. In this case defense may well take the form of concealment away from tracks in dense jungle surrounded by patrols prepared to ambush any enemy who may approach; and by seldom staying in the same place too long.

In either case the main strength of the defense will lie with the offensive action of counteroffensive troops, fighting patrols, and ambushes rather than with the fire power of the static portion of the defense, though this is necessary for the close protection of the defended area.

When jungle is dense, rapid movement is

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necessarily confined to such jungle trails, game tracks, and dry water courses as exist. These are few and normally are used by the Japanese when approaching. Frequent opportunities will, therefore, present themselves for ambushing the enemy and all troops must be trained not only to lay the carefully designed and prepared ambush but also by means of a battle drill hastily to occupy an ambush position at short notice, as soon as they are aware of the approach of the enemy.

The formations to be adopted for the approach march, when within reach of the enemy, will be dictated by two main factors; the need for speed and the denseness of the jungle.

When the need for speed in the actual advance is paramount, e.g., in order to forestall the enemy by seizing a tactical feature, troops will normally move along tracks, and the denser the jungle the more imperative does this become.

When, on the other hand, speed in the advance is not paramount, it will be advantageous to advance on the broadest front which the denseness of the jungle and the required speed of advance permit. By this means, as soon as contact with the enemy is gained, his flanks and weak points can rapidly be located and a frontal or outflanking attack can be speedily launched without the delays which are otherwise imposed by having to deploy off the trail. In an encounter battle of this kind rapid and resolute action is necessary. This is likely to take one of two forms; either a frontal attack supported by all available weapons, which blasts its way forward on a narrow front astride the trail; or alternatively, and probably more frequently, the fixing of the enemy in front, whilst other troops outflank him on one or both flanks and attack him in the flank or rear. In either case the flank protection of the attacking force must never be neglected owing to the Japanese method of defense which frequently retains counterattack troops wide on the flank of their defensive positions.

Under certain conditions a third method

may be necessary in order to reduce delay to the main body. This method seeks to isolate the enemy by fixing him in front, outflanking him on both sides, and closing his escape in rear, whilst the main body bypasses his position and continues the advance. The enemy thus isolated can be destroyed in detail at leisure.

The diligence of the Japanese in the preparation of field works and their habit of placing their flanks on serious obstacles may under certain circumstances necessitate a direct attack.

Under these conditions the most detailed preliminary reconnaissance is essential to locate the strongpoints; the most intense fire support which machine guns, mortars, artillery, and air bombardment can provide and ammunition supply will permit, must be arranged; and rehearsals of the attack should be carried out beforehand. Frontages should be small and objectives must be limited. The strongpoints should be reduced, like pillboxes, by special assault parties of infantry and pioneers or engineers with explosives; special mopping-up parties must be detailed to ensure that all the Japanese in the area are destroyed. To assist in the destruction of pillboxes and "bunkers" every available weapon should be employed. Antitank weapons, flame throwers, and "beehives" have all proved their value.

In all jungle operations the problems of administration will have a tyrannical influence on the battle. For this reason, if tactical mobility is to be secured and tactical superiority over the enemy maintained, provision must be made not only for a considerable weight of direct air support but also for air supply to relieve the burden on the line of communications. Owing to the difficulties of the country and its dissimilarity to other theaters, considerable training, not only by ground formations and units but also by air squadrons and pilots, and the closest co-operation between the two, is necessary in order that the air effort may be applied economically and to the best advantage.

German Army Supply, Evacuation, and Maintenance

Translated and digested at the Command and General Staff School from a Russian article by Colonel L. Punin, Soviet Army, in *Tyl i Snabzheniye* (Rear and Supply) April 1943.

THE basic principles of the organization of the rear as outlined in German official manuals may be summed up as follows:

1. Securing a high degree of mobility and maneuverability of troops.

2. Increasing rapidity of supply and evacuation with simultaneous increase in railroad traffic.

3. Increasing the depth of echelonment of rear elements in order to avoid the effect of

will be only three links of supply: army (up to sixty kilometers), divisional (up to sixty kilometers), and troop (up to thirty kilometers). Thus, the average removal of troops from railheads is fixed at 150 kilometers (Figure 2).

Artillery Supply

All ammunition and matériel from arsenals and factories are moved into the artillery sup-

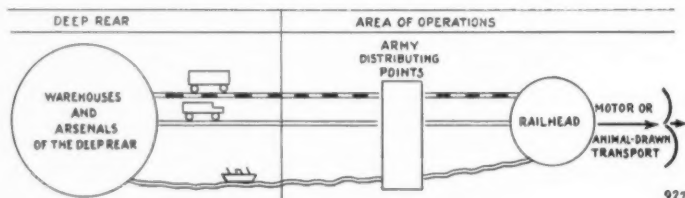


FIGURE 1.
GENERAL ORGANIZATION OF THE REAR AREAS.

front-line fluctuations upon the work of the rear.

The general scheme of supply provides for the deep rear and the areas of operations or theaters of military operations (Figure 1).

Transportation from railheads is divided into four links: army (thirty to forty kilometers), corps (sixty kilometers), divisional

ply storehouses of the zone of the interior, whence on requisition of the high command they are shipped to the front in the so-called "caliber units." The caliber unit of rifle and machine-gun cartridges or mines is fifteen tons (one railroad car), and artillery shells, thirty tons (two railroad cars).

Ammunition is shipped to stations where

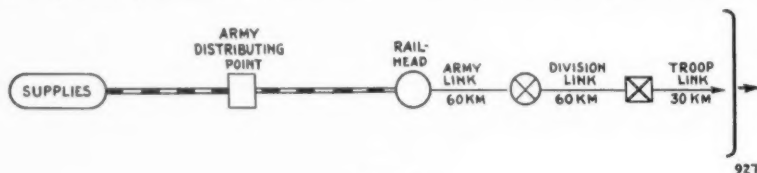


FIGURE 2.
ORGANIZATION OF SUPPLY BY MOTORIZED TRANSPORT.

(thirty to forty kilometers), and troop (ten kilometers, non-motorized transport; and thirty kilometers, motorized transport). In a fully motorized rear, the corps link may be excluded, the divisional link then reaching sixty kilometers or more. In this case there

army ammunition depots are established, or to terminal unloading stations (railheads) (Figure 3). The movement of ammunition from railheads is organized as follows:

a. Directly to division distributing points by means of army or division trains.

Rifle.
Light
Heavy
Light
Medi
37-m
75-m
105-m
100-m
150-m

The movement of ammunitions from division distributing points is shown in Figure 4.

Fuel Supply

From the storehouses of the zone of the

The motorized fuel train consists of tank trucks or trucks with tank-trailers. The small fuel train is good for carrying 110 barrels of 200 kilograms each, or 1,100 cans of twenty

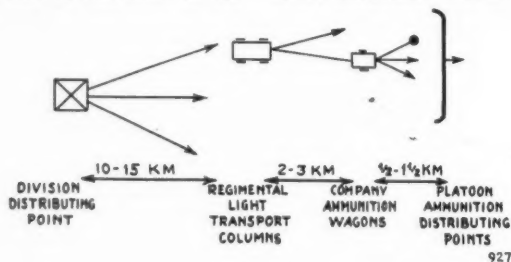


FIGURE 4.
ORGANIZATION OF AMMUNITION SUPPLY WITHIN THE TROOP LINK.

interior, fuel is shipped in special railroad cars through the intermediate transfer stations to the field fuel depots. In field depots, the fuel is grouped into "fuel units" and shipped further on requisitions of the command.

A "fuel unit" consists of the following: gasoline—fifty tons; lubricants—480 kilograms; cleaning materials—150 kilograms; carbide—900 kilograms. For the transfer of a fuel unit by railroad, three tank cars of

kilograms each, or twenty-five cubic meters of fuel in tanks. The large fuel train carries 220 barrels of 200 kilograms each, or 2,200 cans of twenty kilograms each, or fifty cubic meters of fuel in tanks.

Under the direction of the supply section of the division staff, motorized fuel trains establish fuel distributing points. To avoid congestion of vehicles, several centers are established or special schedules for units are made. The fuel train replenishes its supplies

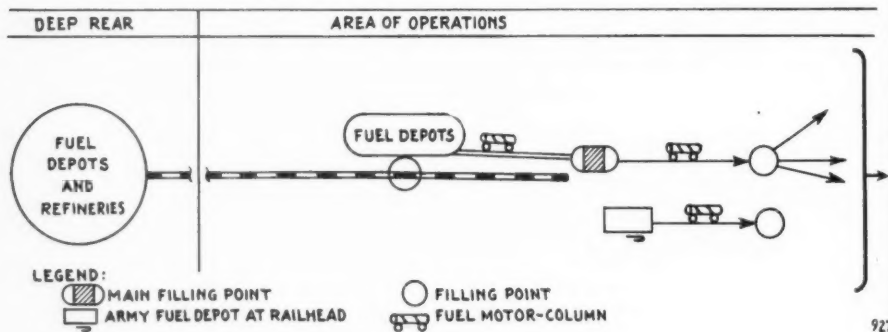


FIGURE 5.
ORGANIZATION OF FUEL SUPPLY.

from fifteen to seventeen tons capacity and a covered car are required. From field depots, fuel is transferred either by railroad or by motorized fuel trains to the filling points (Figure 5).

in the army fuel depot at railheads, or in the main army fuel depots established by the motor park company. The filling of vehicles directly from railroad tankers, or the loading of cans and barrels directly from cars is

allowed only in exceptional cases. Motorized infantry units, as a rule, receive fuel from the main filling points or from the army depot.

An armored division has a fuel supply of from 800 to 900 tons, which amounts to about two and a half refills. With its own means, an armored division can take care of its fuel supply when from 100 to 130 kilometers from fuel distributing points, which, by the way, proved to be insufficient.

Quartermaster Supplies

The German troops receive food and forage from stationary depots and procure it locally.

operate either parallel or in proper sequence (Figure 6).

Bread is baked by the bread-bakers company and is transported to the distributing points by the company. Livestock is dressed in mobile slaughter-houses, whence the meat is delivered to the distributing points.

The German army uses extensively isothermal containers of 3.3 tons useful capacity (frozen meat in packages). Four such containers can be placed on a flat car; trucks or trailers load from one to three, depending on their size.

Food distributing points are located farther

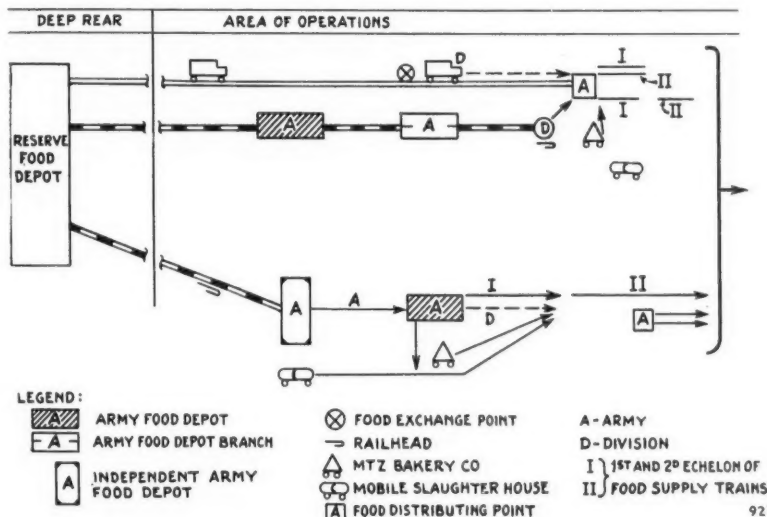


FIGURE 6.
ORGANIZATION OF FOOD AND FORAGE SUPPLY.

From stationary depots in the deep rear the supplies are shipped to army food depots and then to the troops.

From the army food depots the loads are directed to the railheads, or to the food distributing points, or to the exchange points. When distances are long, additional independent army food depots are established. From the railheads, the supplies are moved, depending upon the distance, by army, division, or troop trains. Both echelons of troop trains

from the front line than the ammunition distributing points. An army is allowed from seven to nine days' supply of food and forage. This supply is distributed as follows:

On the soldier	-----1	day's supply
Field kitchens	-----1	day's supply
Troop trains	-----1	day's supply
Division trains	-----1-2	days' supply
Army depots	-----3-4	days' supply

Total 7-9 days' supply

Maintenance and Evacuation of Materiel and Equipment

The German Army usually has several field motorized workshops which are capable of doing medium repairs. There are no railroad workshops in the army—the Germans do not consider their use expedient. An ordnance platoon of the Field Maintenance Army is attached to infantry divisions having only one motor maintenance shop.

A tank group has six mobile workshops for medium repair of tanks; a tank regiment, a maintenance company of three platoons; a tank company, light repair workshops. The

points and then to the army maintenance depots and plants.

Arms and equipment are sent for repair to the divisional assembly points. What cannot be repaired in the divisional or army ordnance shops is evacuated to the rear through the artillery parks.

Medical Service

The medical service consists of a network of medical establishments and means of evacuation. The advance medical aid stations (advance dressing stations) are found from 200 to 500 meters from the front line. From here the slightly wounded are taken to the assem-

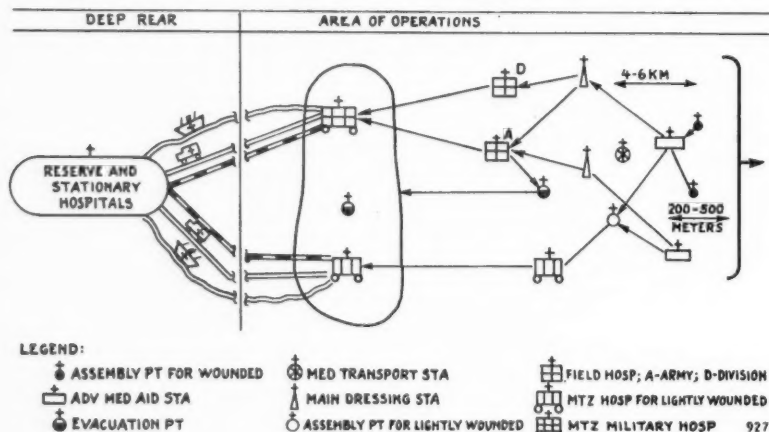


FIGURE 7.
ORGANIZATION OF EVACUATION.

platoon of the maintenance company consists of a workshop on a truck, two or three vehicles with spare parts, an electric workshop, and an electric-welding workshop. It also has trucks for tools, three tractors, and forty laborers.

The maintenance company is located from forty to fifty kilometers from the front line (sometimes thirty kilometers). During battles, the platoons move out ahead one by one, depending on the speed of the tank units.

The collection and evacuation of damaged machines is done by a special army service. It has technical detachments for the evacuation of damaged vehicles to the assembly

bly point for slightly wounded, whence they are evacuated on the empties of the motor transport. Other wounded are taken to the main dressing station which is located from four to six kilometers from the front line. From here they are evacuated to divisional and corps hospitals (capacity of hospitals, 100 to 250 beds) or directly to army field hospitals.

From the hospitals, through the evacuation station, the wounded are sent to the reserve and stationary hospitals of the deep rear. The slightly wounded rest in special hospitals or are also evacuated into the zone of the interior (Figure 7).

Veterinary Service

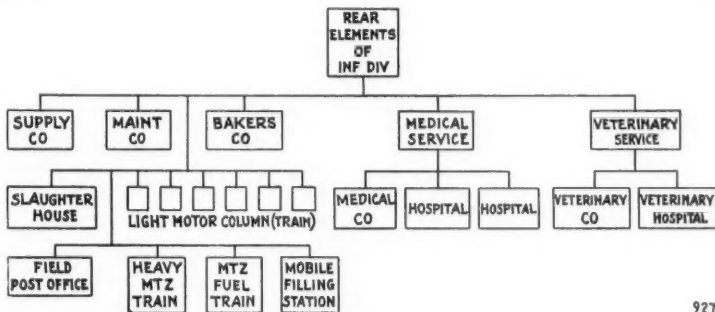
The veterinary aid stations are established in the vicinity of combat trains, whence through veterinary evacuating points, wounded and sick horses are taken to the divisional veterinary hospitals (capacity 150 horses). From the divisional veterinary hospitals the horses in need of further evacuation and veterinary care are directed to the army veterinary hospitals (capacity, 500 horses) situated usually at railroad stations.

Organization of Rear Areas

Organization of the rear areas is built on the principle: center—army—corps—division.

The organization of the rear of the infantry division is shown in Figure 8. The supply company serves as the working group on the reloading points. The maintenance company has motor and ordnance workshops. The medical service has a medical company and two hospitals. The veterinary service has a veterinary company and a veterinary hospital. The light division trains have a load capacity of thirty tons; the heavy ones, sixty tons; while the entire transport of the division can carry 240 tons.

The Germans opened the second World War with a fully motorized rear. Thus, an army corps of the German army had over a



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FIGURE 8.
REAR ELEMENTS OF THE GERMAN INFANTRY DIVISION.

All supply planning is accomplished in the army. The corps coordinates the work of the rear of the division; it decreases or increases the flow of supplies for the division depending upon the situation. The army establishes railheads for troop units, with a separate railhead for each division if possible. More frequently, however, one railhead serves a corps or several divisions. The command tends to organize the railheads as close to the front as possible.

A significant amount of supplies is kept by the army headquarters in army depots and as mobile reserves in trains.

thousand trucks. As a result of great losses in equipment on the eastern front, the German infantry division of the lighter type in 1942 had a rather meager number of trucks, and its transport was basically of horse-drawn type.

The organization of supply of the German Army was based on the theory of "blitzkrieg." But the "blitzkrieg" in the east did not succeed, and the organization proved to be imperfect. The idea of "troops feeding themselves," which worked well enough in other campaigns, has not succeeded in the Soviet Union.

Today, as in the days of Napoleon, morale is decisive.

—F. O. Miksche in *Attack*

Army Antiaircraft Artillery

Translated from a German article by Major General Weidinger in
Artilleristische Rundschau September 1943.

AT THE beginning of 1941 the Führer ordered the reorganization of the antiaircraft artillery as an organic part of the Army. In contrast to the antiaircraft guns of the Luftwaffe, which are employed not only at the front but also in the occupied territories and in the homeland, the army antiaircraft artillery is to be used exclusively for the air defense of the army units to which it belongs in the scheme of organization of the army in the field. Its members wear the army artillery uniform, and as a special symbol they also wear a winged grenade on their shoulder straps in addition to the number.

Through its employment for the protection of marching columns or of the main battle line, battery positions, and tank concentrations for attack, as well as for firing at pill-boxes and combating tanks, the army antiaircraft artillery operates in close cooperation with the principal arms of the service. The versatility of the weapon, the great technical complexity of the heavy batteries, and the great maneuverability of the light batteries satisfy the demands of every real soldier.

Here a few words should be said concerning the difference between antiaircraft guns and antiaircraft defense, for both these terms are often confused. Along with the army antiaircraft artillery the Army since some years before the war has also been equipped with the antiaircraft defense weapon, which in the meantime has become a powerful infantry weapon. It first consisted of units which were equipped with antiaircraft machine guns (Fla-MG as distinguished from Flak = antiaircraft guns) for reinforcing the antiaircraft defense of the troops. There were antiaircraft defense companies and antiaircraft defense battalions. At present the antiaircraft defense arm in the form of antiaircraft defense companies is incorporated in the grenadier and panzer grenadier regiments and is equipped

with 2-cm guns (singles and fours). The guns are carried on self-propelled mounts and are therefore capable of following the infantry over every type of terrain. Their mission is to provide local antiaircraft defense for the grenadier and panzer grenadier regiments to which they belong and whose uniform they wear. The relationship between the army antiaircraft artillery and the antiaircraft defense arm may be somewhat compared to the organization of the signal corps, in which there are communication battalions (like army antiaircraft artillery battalions) and communications detachments (like army antiaircraft defense units, antiaircraft defense companies).

The antiaircraft defense arm has won great fame by its constant readiness to engage in battle against enemy planes as well as to fight shoulder to shoulder with the other branches of the infantry in ground battles.

A relatively small number of army antiaircraft artillery battalions were already able to march against Russia by 22 June 1941. Despite the fact that they were insufficiently motorized that year, which was the first year of their existence, they succeeded in pressing forward, keeping pace with the advance of our armies and rendering them most valuable service in antiaircraft defense and ground combat.

In 1942-43 the army antiaircraft artillery continued to develop. On the eastern front this expanded arm vied with the units of the other arms in the holdest of action. One young army antiaircraft artillery battalion succeeded in destroying 225 heavy and very heavy Soviet Russian tanks in addition to twenty-five enemy airplanes between the month of May 1942 and its heroic end in Stalingrad, that is, in about eight months. A battery commander and two gun commanders in this battalion were decorated with the Knight's Cross (*Ritterkreuz*).

At present most of the army antiaircraft

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artillery battalions are incorporated in the tank and motorized divisions as independent battalions. The battalion commander advises the division commander as to the employment of the battalion.

The army antiaircraft artillery battalion (motorized) consists of heavy and light batteries.

The chief mission of the army antiaircraft artillery battalion (motorized) is to protect the troops against aerial attack. Besides, the heavy batteries with their long trajectories and with the penetrating power of their armor-piercing ammunition are especially suitable for combating enemy tanks and other targets that are capable of resistance; the light batteries are suitable for close defense and also for reinforcing the fire of infantry heavy weapons in special cases.

To state the matter clearly, the chief mission for which the troops and the equipment were designed is to fight the enemy in the air. If antiaircraft guns have so often been used in ground combat during the course of the war so far, this situation has been mainly due to the fact that the numerous enemy tanks represented a greater danger to the troops than did the enemy planes, which our fliers were able to hold in check. Furthermore, if at present the number of our antitank weapons has quadrupled and their penetrating power has steadily increased since the beginning of the war, situations may also continue to occur in the future when all available weapons will have to be used for repelling enemy tanks. Every time antiaircraft guns are used in ground combat it must be remembered, however, that this is the only arm which can successfully combat enemy planes at all altitudes, while all weapons can attack ground targets. The army antiaircraft artillery is therefore to be used in ground combat only in case we have air superiority and other weapons are not available in adequate quantity. Firing at enemy planes that are ever increasing their speed is also extremely difficult, especially with heavy batteries. Success cannot be expected unless the individual services of the battery—aircraft reporting service, range-finding detail, stere-

oscopic fire director crews, and gun crews—work together smoothly. However, this can only be attained by constant practice. Longer employment in ground combat causes a quick and sharp decline in antiaircraft defense, not only on account of lack of practice but also because of the loss of important specialists that are hard to train and because of damage or the inability to take care of the highly sensitive instruments.

Employment against the enemy in the air is for the protection of unloading and assembly areas, roads over which the troops advance, bridges and other narrow passageways, or for the protection of troops on the battlefield. For combating planes with heavy antiaircraft guns a certain density of fire is necessary. The batteries therefore fire at their targets by batteries with all four barrels. In contrast to the heavy battery, the light battery is employed by platoon. But even here success is best assured if the disposition of the platoons makes it possible for them to concentrate their fire on a single target.

Heavy antiaircraft batteries are used against ground targets in reinforcing antitank defense and in attacking targets that offer especially tough resistance (concrete pillboxes, etc.). In special cases, as for example where there is the possibility of the enemy's breaking through, all antiaircraft batteries may be used to ward off enemy attacks. For the rest, however, in view of their special mission and their special ammunition, the heavy antiaircraft batteries are not used for missions adapted to other artillery, such as counterbattery, barrage fire, harassing fire, map fire, etc., and in general they are not to be used in firing at targets which can be attacked just as well by the use of other weapons.

If it is necessary to employ army antiaircraft artillery in ground combat, especially against tanks, this employment takes the form of antiaircraft details consisting of two heavy guns and one platoon of light guns, the light guns undertaking the defense against low-flying planes and attacking ground targets that are not armor-plated.

Because of their high structure and because they are moved on special trailers the heavy guns are not suited for employment in the front lines. They must not be confused with the heavily armored assault guns. When they are used they are properly echeloned in depth behind the armor-piercing weapons of the forward zone of the main battle line. The commander of the combat group assigns the combat mission for the subordinate army antiaircraft artillery; the execution of this mission devolves upon the commander of the army antiaircraft artillery unit concerned (battery commander or senior officer). The greatest success in combating tanks is to be expected when the batteries do not open fire

until the target is within very short range (about 600 meters) (high probability of accuracy of fire, low ammunition consumption, no chance for the enemy tanks to go out of the way).

During the short period of its existence the army antiaircraft artillery has fully proved its worth in hard battles in the east by destroying over 1,000 enemy planes and heavy tanks. The list of officers, noncommissioned officers, and men who have sacrificed themselves proves that this young arm of the service does not lag behind the other arms in readiness for combat and in martial spirit.

Defense Tactics of Small German Infantry Groups

Translated and digested at the Command and General Staff School from a Russian article by Major I. Polyakov in *Krasnaya Zvezda* 5 January 1944.

WHILE engaged in pursuit, one of our squads pushed on ahead of the platoon and reached the eastern slopes of a hill, where it was met by sudden machine-gun and mortar fire. Assuming that the hill was defended by considerable forces, the squad sergeant did not risk any further advance. The platoon commander soon arrived. Having checked the situation, he decided to work around behind the German position with one squad and attack from the front with the remaining forces of the platoon.

The squad was successful in penetrating to the rear of the enemy. The enemy group, taken by surprise, was not able to put up any resistance and all were taken prisoner. The group was made up of six soldiers. Its weapons were unusual. In addition to automatic rifles, it had light machine guns, anti-tank rifles, and two light mortars. Large supplies of mines, ammunition, and hand grenades were also found in the trench.

The episode we have described is of interest in that it shows what sort of tactics the Germans adopt when they attempt to disengage from battle and withdraw. These tactics are characteristic of the action of

small groups covering the withdrawal of main forces. Ordinarily, selected and experienced soldiers equipped with powerful weapons and large quantities of ammunition are used in such groups. In important sectors the numerical strength of such groups is increased, and in addition to this they are reinforced with artillery of various types, including antitank and self-propelled guns. Besides, they are frequently supported by tank and mortar units.

Enemy covering groups delay the advance of our pursuit formations. They display great tenacity and strive to hold back our formations as long as possible.

The tactics of the German covering groups are based on proper utilization of terrain features and fire power. Having at their disposal a large number of different weapons, these groups can stop not only infantry but also tank attacks. Irrespective of terrain conditions, however, there is one feature in their tactics that remains the same. It is their constant attempt to create the impression of a considerable force. And this is what our pursuit detachments should take

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into account in order to prevent the enemy from gaining time.

It is important to consider how these small groups operate under different terrain conditions. Let us begin with wooded terrain. The enemy establishes his main positions in the woods, along rivers or streams, and also in areas where the possibility of outflanking movement by the attacker is limited. As a rule, groups of two or three soldiers with automatic weapons are sent out as combat outposts. These groups operate as mobile ambushes. When our formations approach fairly close, they suddenly open fire with automatic weapons and then quickly withdraw. These groups make reconnaissance sorties and place pursuit forces under the concentrated fire of machine guns, mortars, and artillery. Let us cite the following episode as an illustration.

A rifle platoon of our regiment, pursuing the enemy in the forest, was to have reached a stream by the end of the day. The platoon had had four skirmishes with enemy ambushes on the way. As it approached within gunshot of the stream, it was taken under a concentrated machine-gun fire. The platoon commander decided that this was just another of the enemy's ambushes. Having opened fire, the platoon attacked. The attack failed, however. The platoon was likewise unsuccessful in an attempt to go around the enemy. For this reason, the commander came to the conclusion that the enemy had here an overwhelming superiority in men and matériel.

With the aid of reinforcements, the enemy position was again attacked, and this time with complete success. It was then learned that the position was occupied by fifty soldiers under the command of one officer. This group had twelve machine guns and eight mortars. Each soldier was armed with a submachine gun. Such a group is, indeed, a formidable force for a pursuit platoon which has already suffered some losses. But the platoon commander had the impression that the Germans had a still larger force here. Prisoners affirmed that the Germans had changed machine guns and mortars from one

flank to the other. It should be admitted that in this case they learned quickly in what direction the outflanking operations of our platoon were taking place.

In open terrain, the enemy covering groups select commanding hills which permit the defense of main roads. Their positions consist of several lines of trenches, all connected by communication trenches. The approaches to the position are mined. The first trench is constructed immediately behind the antipersonnel obstacles. It is connected with rifle pits and emplacements for machine guns and antitank weapons, while mortars are disposed in special trenches providing adequate concealment. The remaining trenches are similarly constructed.

The enemy places his weapons in such a way that all approaches are covered by concentrated crossfire. Fires of all the emplacements are coordinated in order to parry the maneuver of attacking groups. In the intervals between the fortified areas, the enemy establishes positions for individual soldiers. It was observed that one soldier manned two machine guns and an antitank rifle, and in addition was equipped with a submachine gun and hand grenades. In this arrangement, the machine guns are situated at a distance of a hundred to a hundred and fifty meters from one another. All this is the result of the limited strength of the covering groups, and of the desire on the part of the enemy to confuse the attacker with respect to the extent and density of the defense.

Such trickery on the part of the enemy is brought to an end, of course, by a careful study of his defense tactics and skilful action on the part of the pursuit formation. The deployment of a battalion, let us say, should not be undertaken in cases where a company will do. Bold movements of these small groups should be combined with strong frontal blows if such are necessary. One must attack the position of the enemy covering force with all the fire power of the heavy infantry weapons and artillery supporting the pursuit groups.

This is very well illustrated by the action conducted by one of our companies. Having

encountered stubborn resistance at the approaches of an inhabited place, the company commander decided to attack it from all sides. Dividing his men into a few small groups, he went around both the right and the left flanks of the German position. While this maneuver was being accomplished, the guns, mortars, and machine guns were brought up. After all these weapons had fired on the enemy, the infantrymen approached to within a distance advantageous for assault. When the artillery transferred its fire to the depths of the German position, the soldiers broke into the trenches. With bayonets, hand grenades, and the fire of their rifles they wiped out fifty enemy soldiers. The remainder attempted to flee, but were intercepted by the groups which had gone around the position. The main feature

in the operation of this company was the speed of reconnaissance, of concentration of weapons, of maneuver, and of the attack itself. The company not only annihilated fifty enemy soldiers and officers but also took twenty-eight prisoners. This example shows that no matter how stubborn the German covering groups may be, they go down under the resolute and skilful blows of our small groups.

The general deductions to be made from all this are these: small enemy groups should be fought by small groups of attackers; the defense tactics of the enemy must be countered by bold reconnaissance and skilful maneuver, based on energetic and intelligent operations and initiative on the part of commanders and troops.

Staff of Tank Unit in Pursuit

Translated at the Command and General Staff School from a Russian article by
Guards Colonel A. Karavan, Soviet Army, in *Krasnaya Zvezda*
4 February 1944.

THE control of tanks in battle, because of their high mobility and because of frequent changes in the situation, has to be extremely flexible. Not infrequently the retreating enemy is on the verge of disaster, but if the decisive blow is delayed he is able to escape a complete defeat and succeeds in retreating with a part of his forces to a new line of defense. A well organized staff skilfully directing the operations of its tank units will always capitalize on the slightest tactical errors of the enemy.

This is specially true for pursuit operations. Here the speed with which the tank commander makes his decisions and the rapidity of their execution means everything. As is well known, the tanks can keep on the heels of the enemy without disengaging, annoy him, and hold him within the terrain suitable for battle till complete routing is accomplished. It is obvious that the methods of control should reflect the spirit of the attacking tanks. Let us consider some of the peculiari-

ties of the work of a tank unit staff during pursuit.

It was emphasized above that the tank commander has to make decisions in battle very rapidly. As a rule, he has to give his combat orders within a few minutes. Tank units usually move along several routes in a zone eight, ten, or more kilometers wide. The longer the order is delayed the more difficult it will be to turn the tanks in another direction, i.e., to rearrange their combat formation. This process will be considerably simplified if the new decision is made right after the situation has changed.

How, then, is such flexibility and accuracy of control attained? The answer, from my point of view, is the correct echeloning of the staff, as well as the skilful use of all types of communication, especially radio. Should the staff of a tank unit break up into small groups or is it more advantageous to work without splitting? During this war, many tank commanders have tried to keep the whole

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staff around themselves. This was done for obvious reasons: when the entire machinery and all means of control are found near the tank commander, this secures the uninterruptedness of control. But the tank commander (commander of a tank unit or group) continually changes his place during battle and stays in the immediate vicinity of the enemy. Under such conditions, the staff, though working as one group, has not enough time to gather and digest all the necessary data and often loses liaison with the higher staffs. Besides, being subjected to artillery shelling and aerial bombardment, it cannot tackle the task of directing the unit.

At first the basic reason for the poor work of the tank staff was believed to be the proximity of its location to the battlefield, and, therefore, a more advantageous distance was sought. This war has proved, however, that the distance is not too important. The cause of the poor work is the fact that the officers of the staff work without a clear division of duties.

It is obvious that one group of staff officers handles the information of the enemy and maintains communication with the higher and lower units, while the other group directs the battle, i.e., transmits the will of the senior commander to the unit commanders and supervises the execution of combat orders. And it is because of this consideration that it is advisable to split the tank staff during all phases of the battle into two groups: the operation group and the second echelon.

What then should the composition of both of these groups be? The operation group should be authoritative enough to be able to make and carry out independently any combat decision. This group should include the commander of the unit himself, all chiefs of sections, the chief of artillery, and by all means, the representative of the air force.

Placing the air force representative in the second echelon is not justified. In this case, an additional link is created between the tank unit commander and his supporting aircraft, which considerably increases the time interval between the calling out of pursuit planes or bombers and their appearance over the

battlefield. Naturally, the air force representative must have his own radio for communication with the airforce commanders. This helps the pilots, during pursuit, to patrol successfully the areas of tank actions and to clear the way for the tanks through intermediate enemy positions.

The second echelon of the staff comprises the rest of the staff officers headed by the chief of staff. All information is digested here, and the senior commander's orders are transmitted to the unit staffs by radio.

The operation group of the tank staff must move in track vehicles or other machines with considerable traction. With this means of transportation the staff officers manage sometimes to bring to the unit commanders a written copy (duplicate) of the order before the text transmitted by radio is decoded. The operation group is located so that it will not be farther than two to four kilometers from any of its units. Then the sending of a written order does not take more than five or ten minutes, which gives the unit commander more time for studying the situation and making the decision. Such an organization of control has often permitted a quick reforming of the combat formation of units. Certain tank units, for example, once attacked a large populated place first frontally through a swamp, then suddenly by-passed it in a wide arc. Since the enemy had not noticed this maneuver, he was attacked from the rear and defeated.

How important it is for the operational group during pursuit to be near the head tank units, especially in difficult terrain, is illustrated by the following example. The enemy had built a strong defensive position along a river in preparation for protracted resistance. Our tank units had to cross the river—each one in its own sector. Officers of the operational group were near the units. They observed carefully the battle for the water obstacle. The attacks of the tanks were not successful, with the exception of one sector where a tank unit had seized the crossing and was ready to drive ahead. This was reported in time to the senior commander. He, using radio, ordered the other tank units to

pass over the seized crossing while the first unit was ordered to protect this operation by fire and maneuver. As a result, all the units crossed over successfully.

Thus the timely information from below resulted in a correct decision. Intervening in the course of the battle, the senior commander prohibited the unit to go beyond the crossing ahead of time, and this influenced the outcome of the entire operation. The enemy could have allowed the first echelon of tanks to pass and then could have blocked rapidly

the only way across the river. The unit would then have suffered heavy losses and the rest of the units could have been delayed for a long time. Thanks to the exact and rapid information this did not happen, and a partial success resulted in success for the entire force.

Skilful direction of tank battles and correct use of all available means of communication will increase the effectiveness of tank operations.

British "Paper Warfare" in Tunisia

Digested at the Command and General Staff School from an article by Captain Con O'Neill in *The Army Quarterly* (Great Britain) April 1944.

READERS of illustrated papers may have noticed, last autumn, a picture of a new weapon—or rather, a new projectile. This new projectile was the 25-pounder propaganda shell.

It was on 22 January 1943 that the first trial round of propaganda shell was fired. We heard the whistle of the shell; a second later, the dull plop of its airburst. And suddenly the empty air was full of—paper. In the glistening light, against the pale blue sky, it sparkled and spiralled, scattered, and slowly fell. It was a sight that was to become fairly familiar in the next three and a half months to many German soldiers. . . .

At first my organization consisted only of myself. It grew slowly and in all, I am glad to say, it grew very little. I was extremely fortunate in being left by my superiors in Algiers very much to myself; and I shall always be grateful to them for the wide liberty and discretion they allowed me. Propaganda in the field can be, after all, a fairly simple business, and there is no need for staff or equipment to be expanded beyond the necessary minimum. I acquired in the course of six weeks two indispensable articles of equipment—a typewriter and a 15-cwt. truck. The latter I needed most, and often loaded to capacity, for the business of delivering my propaganda shells to field regiments or bat-

teries. But it also gave me an indispensable mobility. In visits to airdromes, ammunition dumps, REME [Royal Electrical and Mechanical Engineers] workshops, division and brigade headquarters, and field regiments up and down the front, I covered in the course of three months over 7,000 miles. The propaganda staff was equally modest. An invaluable private soldier was attached to me by corps and took over from me the complicated and tedious business of preparing leaflets for, and filling, propaganda shells. Behind this rudimentary organization in the forward areas we had the indispensable facilities of the base in Algiers, which provided paper, help with printing or translating, information, transport, and so forth; and which also took over nearly all the complicated business of organizing the distribution of leaflets by air.

There were only three main methods of distribution: infantry patrols, aircraft, and shells.

We had to begin with infantry patrols, and that this was possible was due only to the fact that the infantry, on the whole, took to the idea and thought it good fun. It is easy to see why. As often as not, a patrol might return without any contact with the enemy. In that case it was pleasant to feel that at least they had left something be-

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hind which might, if he found it, irritate and annoy the enemy. The special circumstances of warfare on the Tunisian front favored this use of leaflets; for between occupied positions there were often deep belts of unoccupied territory, sometimes up to five miles or more in width, and containing farms and even villages which a patrol of ours might visit one night and a German patrol the next. This method, however, disposed of only a few leaflets; and with the stepping-up of distribution by aircraft and shells its relative importance declined.

Aircraft are the obvious and traditional means for distributing leaflets; but for leaflets directed to enemy troops in the field they have certain disadvantages. Where the target is the civilian population of an enemy country, aircraft distribution is ideal; but against troops, who, however numerous, are after all comparatively thin on the ground, it tends to be wasteful and inaccurate. Leaflets dropped from 15,000 feet will, if a ten mile per hour wind is blowing, drift up to twenty-five miles before they touch earth. A German company position may occupy perhaps half a square mile; and in the mountains of Tunisia its occupants might be the only troops in a whole tract of twenty square miles or more. So the chances of hitting it with leaflets from aircraft are poor. I myself had on one occasion the experience of watching our own leaflets fall all around me, twenty minutes after medium bombers had attacked a target six or seven miles distant; and such errors were inevitably common. But aircraft nevertheless could reach targets in the enemy's rear areas far out of range of the propaganda shell, and there was evidence that leaflets so dropped helped to spread a certain defeatism and despondency that percolated from the base areas forward to the fighting troops. In the early stages of the campaign there were many difficulties to overcome in the organization of leaflet-dropping from the air, and few were dropped. But in the last month—when it could be most effective—it was going full blast, and many million German and Italian leaflets were dropped.

Then there was the shell; and my work was mainly a story of its development and increasing use. After two trial shoots, the first real propaganda shoot took place on the 3d of February. In this first shoot we fired only seven rounds, and we fired them after dark, as I thought the German troops would have a better chance of getting the leaflets if officers and NCO's had not seen them fall and forbidden their collection. Later we used to fire them mostly by day, on the theory that even if you didn't get a copy it might stimulate your curiosity more and arouse higher flights of speculation if you watched the shell burst and the leaflets flutter down. I don't know which theory is sounder; but in any case the shells carried leaflets into the hands of many thousands of Germans.

The great advantages of the shell are, of course, its considerable range and its great accuracy. It can put down leaflets on the few square yards out of many square miles where German troops are actually to be found. And another great advantage, from my point of view, lay in the fact that gunners like letting off their guns, no matter what happens to be in them. On the whole, the idea of this new projectile appealed to them; and what pleased me most was the fact that it seemed to appeal to the ordinary gunners and bombardiers most of all.

The use of propaganda shell continued on a steadily increasing scale throughout February, March, and the first three weeks of April, and in this period a number of shells loaded with Italian leaflets were fired by British 25-pounders supporting French troops in the sector south of the Djebel Mansour. I used to reckon that 20,000 leaflets from shells were worth half a million from the air.

Now what was the result of all this? First of all, let me state what were its objects; and to do so I quote from a paper I got corps to circulate for me in January. Here the objects were described as follows: "To lower the spirit and fighting value of German troops. To harass, worry, and upset them. (The mere fact of being 'propaganded,' even if you do not believe the propaganda, is disturbing to the individual. It is also a con-

siderable nuisance to the authorities, who are obliged to take various countermeasures of security they would like to avoid.) To ensure if possible that Germans will take opportunities, when they come, of surrendering (as prisoners of war) which otherwise they might not have taken. To cause desertion. This last will be ostensibly the primary purpose of propaganda; but though this is the ideal object, it is not likely to be achieved to any great degree, and therefore the other objects are more important."

Were those objects achieved? On the available evidence it would be possible to make big claims. It would be possible, too, to whittle them down to very little. But not to nothing. For we got a good deal of firm evidence of the nuisance value of our propaganda to German commanders; of the prohibitions and threats it forced them to issue, and the punishments it forced them to inflict. We were honored, too, by a couple of articles in the local German Army paper *Oase* violently attacking our propaganda efforts; and the Germans knew their business well enough in this field to have left the subject alone in public unless they felt countermeasures were needed. Let me conclude the argument with three facts. First, our propaganda had by the end of the campaign become very familiar to German troops. Second, never were German troops more vulnerable to propaganda than in Tunisia, where at the end they were attacked by greatly superior forces, virtually deprived of air support, and, above all, cut off from Europe by a sea they did not control. Third, it is clear from a number of German documents captured in Tunisia, which referred not only or even primarily to that campaign, that propaganda against their troops in the field is a weapon much dreaded by the German High Command.

What then will be the value of "front-line propaganda" against German troops in the future? What importance, if any, should Allied forces in the field attach to the support it can give them? How seriously should commanders take it? How far should they go out of their way to help it work?

There exists among British soldiers a very proper and healthy suspicion of propaganda, based mainly on two lines of thought. The first runs thus: "This business is all very fine, and it may be effective. But isn't it a bit unfair and even dishonorable? I prefer to beat my enemy by using superior military resources and skill." The second runs thus: "This stuff wouldn't have the slightest effect on our own men, so why should it on the Germans?"

The first of these misconceptions—for that is what I believe them both to be—was expressed classically by the commanding officer of a field regiment in Tunisia to whom the officer who worked with me in the latter part of the campaign took a load of propaganda shells for firing. He was very friendly and readily agreed to shoot them off. But he observed: "I can't help feeling it's a bit like running a chap out before you bowl." A remark at which it is easy, no doubt, to laugh; but it expresses an attitude with which the propagandist in the field must learn to deal, and which he must handle with all the tact he can muster. It is an attitude based in the last resort on an overestimate of the power of propaganda, on a belief that it is something mysterious, which can operate effectively in a vacuum, divorced from other manifestations of military power. This is not true. In time of war all propaganda—not merely that used in military operations, but the whole paraphernalia of State broadcasting and information services—is in the last resort no more than a gloss of military power. The most efficient propaganda service will avail little to a State if its relative military power is declining, if it is losing the war. The same is true on a smaller plane of a local military operation. Propaganda cannot turn defeat into victory. It probably can do little even to tip the scale of an equal contest. But it can do something to hasten victory if victory is coming anyway; to exploit it and make it more complete. Propaganda can do little till it sees which way the cat is jumping; it is thus in a sense a parasite on success; it is the shrill-singing wren on the shoulder of the soaring military

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eagle. But it is useful all the same. Airmen and gunners in Tunisia used sometimes to ask me if I didn't think bombs and high explosives spoil the effect of leaflets. I used always to answer that leaflets were quite useless without bombs and shells, but that I thought bombs and shells were a little bit more useful with leaflets.

The second misconception is based partly on a lack of understanding of the different psychologies of a winning and a losing army, partly on a lack of understanding of the mentality of the German soldier. It is perfectly true that German propaganda could have had no effect whatever on Allied troops in Tunisia, as the Germans very well knew. They made only a very few half-hearted efforts to use propaganda against us at all. We were impervious largely, but not entirely, because we were winning all the time and knew it. We were also impervious because on the whole we were fairly well-informed about events everywhere in the world; we believed the news we heard; we trusted our leaders at home and in the field; and we had confidence in our own future and in the general future of our countries and the world. The German soldiers had less and less left of these advantages. News—which even on the battlefield is the best propaganda—could still open their eyes pretty wide; could stimulate that fear of the future, promote that weakening of loyalty to military or political leaders which is part of what the propagandist aims at. Get the German soldier thinking as an individual, and he will think of war and peace, death and captivity, as they affect himself, his friends, his family, his future. Then, when battle puts the question to him, he may answer: "Why should I get myself killed? Are not prisoners luckier

than dead men? And is not the way of captivity, in the end, the way home?"

Another misconception I should mention, because I often encountered it. Once soldiers begin to believe in propaganda they tend sometimes to believe in it to excess. They forget its limitations, which as I have tried to show are many and great, and try to treat it as they might treat any other supporting weapon. They tend to think it can produce short-term results; but this it can seldom do. I often heard it suggested that, say, a particular German unit was in a pretty bad way and a little judicious propaganda might virtually put an end to it. This was too flattering. It is no use bursting a few propaganda shells among the smoke that is to screen the infantry's assault. But if the enemy holding the position has had a good dose of leaflets a week or even two days before, then it is just possible that the infantry's assault may be made a little easier and be a little less costly. It takes some time to change the enemy's mind.

War itself is, after all, only a drastic means of changing your enemy's mind. He thinks it worth while to oppose your will; war is meant to convince him that it is not. In this great debate, shells and bombs are themselves the arguments; but propaganda can help a little to draw their moral and point their conclusion. Commanders may feel that such a weapon is worth having and worth at least a little of their time and attention. And they should remember that it is a weapon the Germans fear.

If you have persuaded ten thousand German civilians that the war is lost for Germany, you have done much. But if you have persuaded ten German soldiers to stop fighting, you have done more. It is the German Army that matters.

Self-Propelled Battery: Going Into Position

Translated at the Command and General Staff School from a German article by Captain Krüger in *Artilleristische Rundschau* March 1944.

THE strength of the self-propelled battery lies in its all-terrain capabilities, in its mo-

bility, and in the rapidity with which it is capable of opening fire. This leads to entirely

new possibilities in the matter of bringing the self-propelled battery into position. The method is determined by the terrain, the march formation of the battery, and the available time. The following discussion regarding moving into position does not deal in an exhaustive manner with all the possibilities, but only with the most important methods.

The battery executive travels ahead of his battery. Shortly before he reaches the fire position area, he advances to a distance of about 500 meters ahead of the battery. As soon as he has reconnoitered the firing position, he gives the order for the guns to move into position, and stops his vehicle so that the radiator points in the general direction of fire. The battery executive then draws up close to the NCO in charge of the aiming circle in order to be able, later, to transmit the aiming-circle readings to the guns by radio. In case the battery executive should already be busy with firing missions, he gives the order, after the guns have got into position, "Aiming circle to the rear of the battery!" whereupon the No. 3 cannoners hasten to the aiming circle in order to obtain the readings for their guns.

First method of going into position (Figure 1):

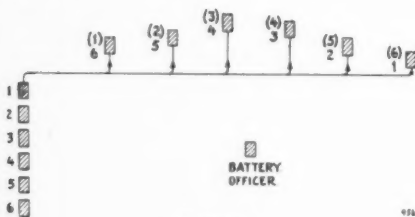


FIGURE 1.

The guns are traveling in single file. The fire position is to the right of the highway. The battery executive gives the guns the order by radio: "Firing position! First gun, to the right!" After the first gun has left the road the battery executive gives the command: "First gun, to the left! Halt!" The second gun moves on past the rear of the 1st gun and, as soon as it has taken the proper

interval, makes a left face and halts beside the first gun, allowing for echelonment. The remaining guns act accordingly.

Second method of going into position (Figure 2):

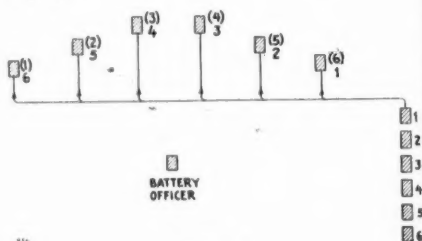


FIGURE 2.

The guns are traveling in single file. The fire position is located to the left of the route of march. The guns leave the route of march single file, and on the command "Firing position," assume the distance which is later required for the interval. The battery commander gives the command to all guns, "By the right flank! Halt!" Hereupon, the guns assume proper interval and echelonment in relation to the third gun.

Third method of going into position (Figure 3):

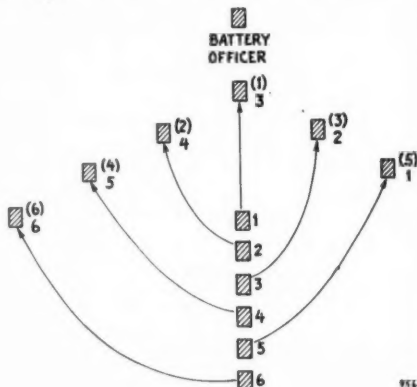


FIGURE 3.

The guns are traveling in single file. The situation requires that they continue from this point in wedge formation. For this purpose, the battery executive gives the com-

mand, "Wedge formation!" The first gun continues straight ahead behind the vehicle of the battery executive in the capacity of third gun. All guns designated by even numbers veer to the left; all by uneven numbers, to the right. In this maneuver, the distance between guns amounts to some fifty meters; the interval, some sixty to seventy meters, relative to No. 3 gun. As soon as the firing position has been reached, the battery executive brings his vehicle to a stop, points it in the general direction of fire, and commands, "Fire position!" The third gun continues on past the executive's vehicle. The executive then commands, "No. 3 gun! Halt!" The other guns take up position in accordance with the position of the No. 3 gun.

The terrain may require that the wedge formation be assumed when the guns go into position. For example, let the battery be traveling along a forest road (Figure 4). They are to go into position in a clearing in the woods or along the side of the highway. The executive gives the command, "Fire position! Wedge formation!" When necessary, the No. 3 gun can be moved to the right or

left by means of radio, as it goes into position: "No. 3 gun! One hundred meters to the right! Halt!" The other guns move up into position as described under the third method.

The above described methods of going into position by a self-propelled battery require capable NCO's (platoon leaders and gun commanders) and trained drivers. Only then

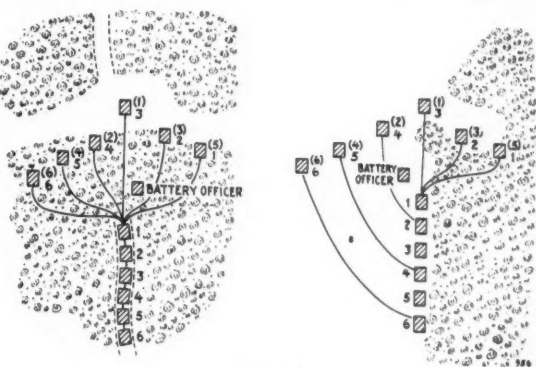


FIGURE 4.

is it possible to go into firing positions from a moving formation without later having to make changes in the disposition of the guns, which would occasion a considerable delay in the opening of fire.

Structure of German Military Morale

From an article by "A Specialist on Enemy Propaganda" in
The Fighting Forces (Great Britain) April 1944.

THE necessity of maintaining morale and fighting spirit in the German Armed Forces is an issue which concerns not only the German High Command but is a matter of great moment to the State and Party authorities in Nazi-Germany. The psychological basis of leadership in the German Army is completely founded on the principles of Nazi philosophy and an unquestioned acceptance of its precepts is regarded as an important condition in the qualification of all officers and men with the colors. Without it, the best training

and drill can have only a very limited value. Such is the opinion of the authoritative German military circles.

There are two bodies directing the propaganda activities within the German Army. The Party authority known as *Beauftragter des Führers zur weltanschaulichen Schulung der Wehrmacht* (The Führer's Commissioner for Training in Outlook on Life in the Armed Forces) and the *Oberkommando der Wehrmacht Abteilung Wehrmachtpropaganda* (The High Command Propaganda Branch). Both

work in close cooperation. The political and social issues considered useful for propaganda purposes are mapped out by the Commissioner, Propaganda Branch of the High Command, who adapts them in conformity with the military demands and puts them into operation.

Emphasis is laid on the most intensive ideological training in the matter of National-Socialist principles and ways of life. The idea behind the war is repeatedly explained to the soldier, who must have complete confidence in all political, economic, and military measures adopted by the Führer, his Government, and the commanding officers. Soldiers are made fully aware of the meaning of Germany's "struggle for freedom" and every effort is made to inculcate troops with the urgency and necessity of the historic mission of the German nation, and to spur them on to a greater display of courage, devotion to duty, and endurance in battle. Political enlightenment is one of the main tasks and, in Nazi philosophy, instruction is regarded as a military factor tending towards a development of the soldiers' utmost fighting qualities and their readiness for sacrifice.

The propaganda duties in the Armed Forces are entrusted to Welfare Officers. These specialists are attached to all the units in the field and to the Home Forces. They are responsible for education in Nazi-philosophy and for the spiritual and material welfare of the troops. They deliver lectures on current news developments and lead discussions. They provide troops with current publications, issued either by the Army Headquarters or other commands and Party offices. They supervise entertainments, games, radio, film shows, and collaborate closely with commanding officers in such matters as welfare needs, appointments, etc.

It is of great interest to examine some of the spiritual items which serve as a means for influencing the German soldier's mind. There is a continuous circulation of publications dealing with current political and economic problems, such as "Pamphlets for Welfare Work in the Army," "Knapsack Pamphlets," and "The Silver Sea-Gull

Series." All the above-mentioned pamphlets explain the conception of the German New Order, the aims of the war, the task and duties of the soldiers at the front, and contain, *inter alia*, a large number of anti-British distortions. In addition, special propaganda books are issued by numerous publishing offices of the National-Socialist Party and distributed among the troops, together with a vocational training book series named "Dr. Goebbels' Gift for the Armed Forces."

Detailed instructions for the education in the Nazi view of life are given in official pamphlets such as "Education in Outlook on Life and Spiritual Welfare in the Army," "The Officer as Leader in Combating Enemy Propaganda," and "Discipline and Personality." All these publications are designed to facilitate the Welfare Officers' job in diffusing into the soldiers' minds the "conqueror ideology" of the German nation, as a natural and justified right of the latter, and thus produce a pliant type of soldier, who not only shares and identifies himself with the whole program of conquest and exploitation but is ready for all sacrifices required of him by the Fatherland.

A special press edited for the troops in the various theaters of war and in the garrisons of the occupied countries plays an important part in that program. There is hardly a technical unit which does not publish its own newspaper. Special troops and formations have their own newspapers too. Apart from these, numerous local organizations of the Nazi Party and the S. A. Storm Troops are regularly sending to their members in the forces local periodicals named *Feldpostbriefe* (Field Post Letters) and *Soldaten Heimatbriefe* (The Soldier's Letters Home), which are aimed at maintaining the link between the Party in the homeland and those at the front. These periodicals must be regarded as a supplementary propaganda stream.

Propaganda work in the theaters of war, at the front, in the field bases, and the garrisons in the occupied countries is carried out by special units called Propaganda Battalions and Propaganda Companies. The personnel of those units consists of professional journal-

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ists, war reporters, interpreters in foreign languages, photographers, newsreel cameramen, painters, radio operators, and commentators. They receive normal military training and attend courses at special training centers for acquisition of techniques adaptable to the field of battle. Their duties are varied. They accompany troops in action, prepare articles and reports for publication by the press and the radio, take photographs and films. The "Active Propaganda" Section of a Propaganda Company has the very important task of exercising influence on the enemy through undermining his morale by front-line dissemination of leaflets calling for wholesale desertions, and by addressing enemy troops with demoralizing speeches aimed at destroying their discipline and will to fight. They are provided for that purpose with powerful loud-speaker amplifiers. The Propaganda Companies and Battalions are furthermore entrusted with the spreading of propaganda among the civilian populations behind the front line, with the editorship, printing, and distribution of newspapers in the mother language of the occupied countries, and the organization of film programs. The activity of those special formations is based on a pre-war study of the character and "on the spot" analysis of the frame of mind in foreign nations, which study has been developed to a military science. The Foreign Division of the Psychological Branch of the German General Staff, headed by Major-General Blau, has elaborated an ingenious scheme of "psychological intelligence" for the detection and

analysis of the characteristics of enemy nations by a systematic exploitation of all the available resources. The main task consists in the exploring of all the weak and strong points in the mental structure of the enemy, his political, social, and economic institutions, as well as his military sphere, and to employ methods capable not only of "softening up" enemy population as a whole, but also of undermining the morale of enemy fighting troops.

The work of the Welfare Section of a Propaganda Company is confined to its own troops. It includes the arrangement of theatrical performances, concerts, film shows, broadcasting, distribution of books, operation of field libraries, and publication of newspapers. They are equipped with ample technical facilities. A great part of the propaganda units are mechanized. According to current demands the personnel is attached to various tactical formations, regiments, divisions, corps and army commands, and groups for special tasks. Different branches of services, such as the Luftwaffe, Navy, and Armed S. S., have their own propaganda detachments, too.

The powerful apparatus of German military propaganda was built up on a gigantic scale, as an integral part of the conduct of war. It is obvious that it calls for the utmost watchfulness and merits immediate and strong countermeasures.

German propaganda can justifiably be labeled the Teutonic nation's first line of defense and its last line of resistance.

German Engineers in Withdrawal Movements

Translated at the Command and General Staff School from a German article by Lieutenant General Klingbeil in *Hamburger Fremdenblatt* 29 March 1944.

DURING the first years of this war, which were characterized by the strategic offensive, the engineers blazed the trail and prepared the way for the advancing German armies. They cleared the way through enemy fortifications and across hindering river barriers, removed barricades and minefields, and re-

paired highways and bridges in order to provide for the uninterrupted movement of the armies and the prompt establishment of the flow of indispensable supplies.

In the retrograde movement according to plan, which at the moment characterizes our strategic defense in the eastern and southern

Italian theaters of operation, the engineers render the breaking of contact with the enemy easier and at the same time limit the mobility of the enemy to as great an extent as possible.

For the frictionless execution of the planned withdrawal movements, perfect marking of the routes over which the withdrawal is to be made is of particular significance. To this also belongs the construction and reinforcement of the bridges as well as the creation of new means of crossing river barriers. This task is particularly important and complex in the case of withdrawal on a vast extent of front. It is only when the main forces have passed over the natural obstacle that the engineers are able to set to work dismantling their ferries and army bridges piece by piece, and dispatching the valuable bridge equipment to the rear.

The task of delaying the enemy is executed by the systematic blocking of main traffic routes. River and lake sectors, swamps and marshes, mountains, and dense, trackless forest areas are especially suitable as barrier areas. Highways are blocked by felling the trees bordering them; forest roads are barricaded by tree entanglements with concealed explosive charges. Naturally, the points of main effort in the construction of these barricades are located on the main traffic routes—the large highways and railways, and especially at junctions, highway intersections, and in railway yards. Bridges and culverts, central signal and switch control towers, and individual switches are blown up, and highway intersections converted into great bomb craters.

The mines are either planted at important points in the form of continuous minefields or are dispersed singly. A combination of actual and dummy minefields is also effective. At important points, especially in front of centers of resistance and in front of the new positions which are to be occupied, the engineers add antitank ditches and wire entanglements.

How effectively these obstacles are able to delay the advance of the enemy is shown by

the British-American reports relative to the southern Italian field of operations and the snail's pace of their offensive whose tempo is dictated by the numerous German obstacles.

In this era of total war, however, it is also necessary, during the course of the evacuation operations which precede withdrawals, to destroy traffic installations and industrial establishments of military importance, and to move them to the rear in order to serve our own war industry in another place. Hence, in addition to traffic installations, pumping stations, water towers, roundhouses and turntables, and power, telephone, and telegraph lines are also wrecked. In the cities, all establishments connected in any way with enemy supplies are either burned or blown up. In the rural districts, barns, storage places for grains, mills, and springs must no longer be of any use to the enemy. Houses and barns which the enemy might use as shelter are likewise included in the barrier and destruction plans, as well as places suitable for assembly areas, areas in which to prepare for an attack, or areas which might be of assistance to the enemy in approaching our forces or in concealing himself from our view.

In order to insure the factor of surprise, it is absolutely necessary to avoid letting the enemy know of our intentions to withdraw, or draw any conclusions relative to the time of the withdrawal. Depending on the situation, therefore, the necessary measures are taken as far in advance as possible and in such a manner as not to attract attention; or they may be carried out suddenly, at the last minute, only when the main forces have already left.

The varied and extensive tasks which fall to the lot of the engineers in retrograde movements make it extremely necessary, especially in the vast spaces of the eastern theater of operations, to insist on carefully ordered coordination both in the preparation for their tasks and the employment of the divisional and army engineer battalions, the engineer bridge battalion, the construction engineers, the bridge trains, and the assault-boat units. The execution of the tasks requires that engi-

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neer commanders of all grades must have a good knowledge of tactics and a marked ability to distinguish between the essential and unessential, and between that which can be done in the time and with the forces at their disposal and that which is beyond their ability. Lack of time, of forces, of explosives and means for detonating them often limit them in their choice and execution, and force them to make use of substitutes. Engineers often have to be employed widely dispersed over a wide area. For this reason they must be mo-

bile, independent in their operations, and always ready for action.

The engineers are always the last to disengage from the enemy. They cannot blow up highways till all their own vehicles have passed the point. Not until their "pilots" have guided their own troops through the mine-fields can they set the fuzes of the mines they have planted in the highway. Not till the last troops have passed by can the trees which have been provided with explosive charges be felled to form a barricade.

RAF Over Burma

Digested at the Command and General Staff School from an article in
The Aeroplane (Great Britain) 7 April 1944.

THE lay-out of the Royal Air Force in India before the beginning of the war was naturally designed for the protection of the North-West Frontier. Suddenly, the Air Staff was faced with a war on the opposite side of the huge continent. Quite apart from problems of supply, material, and aircraft, the problem of maintenance had to be tackled. Maintaining a force of aircraft in Bengal with one's maintenance facilities at Karachi is comparable with trying to run an Air Force in England with one's maintenance resources in Warsaw. Men, machinery, and material were hurried across the continent, and maintenance units were established where they were in a position to meet the urgent demands of the fighting Air Force in Bengal and Assam. Here again there were great difficulties, because admirable though the Indian rail service may be, it cannot compare in efficiency with the vastly developed system we know in Europe. Lines are usually single track, rolling stock is scarce, and gauges vary from the standard to the metric. Cyclones and floods frequently break up the embankments and the bridges. At first sight the task appeared insuperable, but it was done, and only those who know India can appreciate what a colossal task it was for the Air Officer Commanding-in-Chief and his maintenance staff.

Few people in England realize the areas over which our bombers in Bengal have to operate. Suppose we take a line from Calcutta to Bangkok, 1,000 miles, or equal in distance from London to Tunis. Even Rangoon is as far from Calcutta as London is from Genoa. In these long-distance raids, our bombers frequently have to go over hundreds of miles of sea, and for obvious reasons the Indian Command does not possess the facilities for air-sea rescue as are at the call of the Metropolitan Bomber Command. Although weather is one of the greatest problems facing the English Bomber Command, it is also a very serious problem for the bombers of Bengal. During the comparatively brief fine-weather period there is frequently quite a dense haze lying over the targets in Burma, while during the monsoon period our bombers frequently have to contend with weather more difficult than anywhere in the world.

The Japanese are adepts at the art of concealment, and the problem of finding a Japanese airdrome many hundreds of miles from the bomber base is one which exercises the art of navigation to the utmost. Towns and targets such as marshalling yards, rail-heads, etc., are few and far between, and also in many cases as difficult to locate as enemy airdromes. Because of the difficulties of sup-

ply it has not been possible for our aircraft to be equipped with all the modern aids to navigation now available to Bomber Command in England; neither are there such facilities for guiding the bombers home.

The task of a bomber commander in Bengal is again considerably more difficult than that of a commander in England. Not only are the bomber stations situated in a country where the climate for nine months of the year is arduous in the extreme for both flying and maintenance personnel, but the stations themselves are vastly different from the neat, self-contained units we know in England. Many a bomber station covers an area of forty square miles and sometimes the group captain in charge is responsible not only for this station, but also for one or even two others which may be many miles away and equally large. Many an air commodore in England running bomber units has an easier job than the average group captain in Bengal. For the most part, accommodation for all ranks in the Bengal bomber stations is made of "Basha" huts—made roughly out of bamboo and equipped with the bare minimum of furniture. In spite of all the difficulties with which they are faced, the bomber squadrons carry on with their job day after day and sometimes year after year with very little chance of rest.

The fighter squadrons, on the other hand, get a very much more varied life. For the most part they are at what are called forward areas, their stations are much closer to the enemy and their accommodation is simple in the extreme. They do, however, change from one area to another and a proportion get a chance of spending a certain time in areas like Calcutta, Ceylon, and Madras, where at least some amenities of civilization may be enjoyed.

From the operational point of view, the average fighter pilot has no easy life. If engaged in defensive work, he frequently finds himself outnumbered by the enemy, who, as explained above, has a habit of making periodical raids in considerable strength. Defensive work, however, is only one side of fighter activities in Burma and Bengal. Fight-

ers are frequently operating over the enemy country attacking rail communications and river craft just in the same way as the Spitfires of Fighter Command cross the Channel to shoot up the transport in France. The English offensive fighter makes a swift dash across the narrow sea and spends but little time over enemy territory. Should he be shot up and compelled to land in France, he knows that he will get good treatment from the enemy. Should he have to bale out over the Channel there is a first-class Air-Sea Rescue Service to pull him out. The difference in conditions in the Burmese war may be well illustrated by the remark of one fighter pilot who said, "Once I cross the Irrawaddy I feel safe"—he had only approximately 170 miles of jungle to cross before he reached his base!

The whole country is either jungle, mountains, or both. Should a fighter or bomber have to come down it is usually safer for the crew to bale out rather than attempt to land. They would then have over 100 miles of jungle occupied by the enemy to walk through before there is a chance of being rescued. If caught, their treatment is not quite like that accorded to our prisoners in France.

The night fighters also deserve some recognition as they, again like the bomber pilots, have little chance of a change. Night after night they are up in the air battling against their old enemy Sir Isaac Newton, and only seldom does the enemy come over to give them a chance of fighting. When he does come, that is their reward, but most of their time is just arduous and dangerous flying.

The most over-worked word in all Bengal is the word "monsoon." The monsoon period may be said roughly to last from the last week in May until the first week in October. The time of the monsoon's arrival varies according to the part of the country as does the intensity but, generally speaking, one can assume that during the monsoon period it rains heavily about every other day. When it rains, it does rain. From the flying point of view a typical monsoon rainstorm looks a very menacing sight. The clouds sit close to the ground with blinding rain below and

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thick black clouds going up to perhaps 25,000 feet above. Being caught in such a storm is no joke, and the most skilful blind-flyer is hard put to it to retain control of his aircraft. Such intense storms, however, can usually be seen from afar and avoided except at night. It is no uncommon thing for Calcutta, during a really heavy monsoon rain-storm, to have three inches or four inches of rain in twenty-four hours, which gives an idea of the intensity of the monsoon storms.

Dangerous as the storms are, they are not the chief worry of the monsoon period. The main trouble is the effect on the climate, for the monsoon brings with it a most peculiar and revolting humidity which makes the climate in the monsoon period in Bengal and Assam one of the most physically trying in the world.

For months on end one's skin is never dry by day or by night, for the nights are nearly as hot and equally moist as the day. The Demon "Prickly Heat" assails everyone and over ninety percent fall victims to its horrors. Quite apart from this particular handicap, the constant warmth and humidity is apt to cause mental lassitude and depression and make one an easy prey to fevers or jaundice. Although, therefore, the monsoon is not the constant steady rain imagined by the readers of certain tropical stories, there is no doubt that it is the worst enemy of all

the forces serving in Bengal and Assam. Anyone who has spent a monsoon in Bengal and has come through it without loss of health or mental efficiency is indeed a man. Few can take more than two monsoons and remain efficient.

The storms and rains naturally curtail flying activities, but in no way stop the RAF from its operations. The main problem confronting all commanders during the monsoon is that of maintaining the spirit and morale of their forces during this trying and difficult time. No one who has not spent a monsoon in Bengal or Assam can understand how wearying its effects can be.

The war with Japan may be a long one and may continue long after the war in Europe is over. The problem of keeping up a high morale in a force fighting a tough and relentless enemy in a far-away country after the German war is over will be no easy one. Keeping up morale will then be the crux of the whole problem.

Service in Bengal and Assam, and, indeed, the whole of India, means adventure and good fellowship. In the past in India, it may have been looked on as a dead end. Now, and in the future, it is, and will be, one of the real fighting fronts where honor and the rewards of promotion are freely given to those who have stood up to the peculiar and trying strain of this distant war.

Planning the Operations of Armored Force Artillery

Translated and digested at the Command and General Staff School from a Russian article by Colonel P. S. Afanasyev in *Artilleriiskii Zhurnal* (Artillery Journal) October 1943.

MOBILE groups are moved into the breakthrough when the main defense zone is breached and the infantry has reached the area of the enemy artillery positions, or after the second defense zone of the enemy has been occupied. This determines the composition, missions, and role of the artillery assigned to support the action of the mobile groups. The principal mission of this artillery is to suppress, quickly and decisively, the antitank

defenses and the enemy artillery on the flanks and along the front of the breakthrough.

The organic artillery of tank units is the basic element of the artillery supporting the mobile groups. Not infrequently, however, it is reinforced by artillery units from the GHQ reserve. It should be emphasized that high mobility of tanks requires that the accompanying artillery be possessed of high ma-

neuverability and be capable of opening an effective fire quickly. Without this, the artillery will not accomplish its missions. From this it follows that the accompanying artillery should be medium (gun) artillery which is to be provided with sufficient transport to carry ammunition—at least one and a half days of supply. If a well-organized defense in the operational depth of the enemy posi-

coming operation should be given much attention. It will be necessary to take into account all technical and tactical peculiarities of each caliber, and the missions of the mobile group, and to study in detail the area of the impending operations.

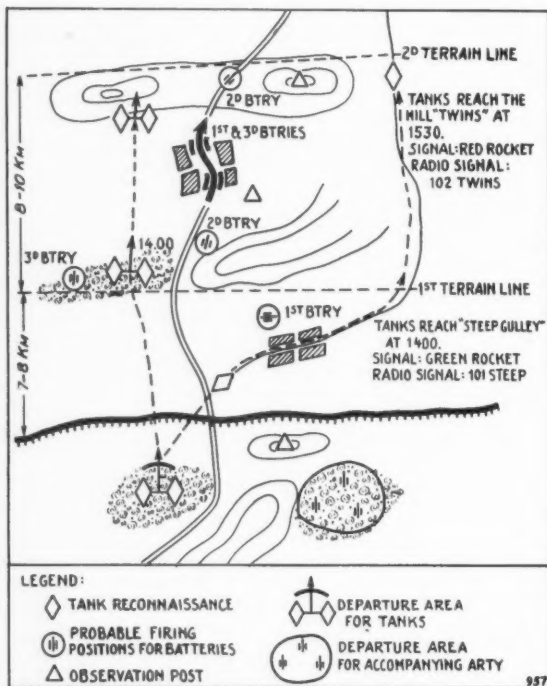
The army artillery staff planning the operations of the artillery should work out missions of the mobile group for each of the terrain lines and, in accordance with this, should plan the action of the artillery for the period of the movement of the group into the breakthrough.

The following points should be clarified in the plan:

1. Missions of the mobile group by terrain lines (which units go where, their missions, routes to follow, etc.);
2. Basic missions of the breakthrough artillery [evidently artillery in direct support of breakthrough.—Ed.] firing from their main positions;
3. Missions of the accompanying artillery (self-propelled or antitank, attached to accompany the tanks);
4. Areas or lines of probable encounters with the counterattacking forces of the enemy, and the strongpoints in the depth of the enemy position located by reconnaissance;
5. Requests for fires (how and through whom).

Such a plan should not be stereotyped. Depending upon the

situation and the mission, it will change its form and contents. The contents will be determined depending on what staff draws the plans and for whom. The plan made by the staff of the artillery regiment assigned to support a mobile group in the operational depth, for example, consists of an overlay showing the routes of the motorized units, a list of missions for the units of the regiment by terrain lines, and a table of signals for opening and ceasing fires. The route overlay



tion is encountered, the destruction of which calls for more powerful weapons, it should be reinforced by howitzer artillery. [Medium (gun) artillery would probably include 107-mm and 122-mm guns; howitzer artillery, 122-mm and 152-mm howitzers.—Ed.]

The plan of operations of the artillery assigned to support a mobile group is always a part of the general plan for the whole mobile force. And it goes without saying that the preparation of the artillery for the forth-

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(see sketch) is made, as a rule, for each battalion (and battery), and sometimes, when it is necessary, for each platoon and even each piece.

Artillery commanders should be familiar with the missions of the mobile group, as well as with the main direction of its advance and the limits of its operations. In addition to this general information, the staff of the mobile group must indicate to the artillery commanders routes to follow and the location of terrain features where the counter-attacking forces of the enemy are likely to be encountered, as well as the location of known strongpoints, for it is on the basis of this information that the artillery commanders will plan their actions. From the army artillery staff the artillery commanders receive, as a general rule, an overlay showing the fires of the long-range artillery, and from the artillery staffs of the troops attacking within the zone in which the artillery is to operate, a general plan of their battle formation. Without this information, the artillery commanders will not be able to accomplish their missions effectively.

As soon as the tank group passes the tactical depth of the hostile defense, reconnaissance on the flanks becomes very important. To take care of this, the tank commanders send out special reconnaissance parties made up of reconnaissance tanks and motorized infantry detachments. Artillery commanders, in their turn, detail artillery reconnaissance groups for joint operation with the above reconnaissance parties. These artillery groups report the appearance of the enemy tanks and the location of terrain features occupied by enemy antitank weapons. They are also charged with the selection of positions and approach routes to them, should it become necessary to deploy in order to attack the flanks of the counterattacking enemy units. In assigning missions to these reconnaissance groups, the commander indicates terrain features and the time they are to be passed by our tanks. Communication with the reconnaissance groups is maintained by means of signals if the terrain is open enough, or by messengers on bicycles or motor-

cycles. Skiers may be used in the winter time.

Since accompanying artillery units move almost continuously and stop to fire only when it is necessary, the control of these units by technical means of communication is almost impossible. They are best controlled by signals from the commander's observation post. For this reason, when at the line of departure, all staffs of the artillery units accompanying the tanks designate a limited number of simple signals. Experience shows that five or six basic signals will suffice. More important signals indicate where the enemy tanks have appeared, where and what obstacles are encountered, what battery is to fire, and what to do and in what direction.

The signals are thoroughly memorized by all the men in the unit, and this is later checked. Excessive use of rockets is not recommended since this type of signaling is widely used and may lead to confusion.

It should be emphasized that a well-planned cooperation of the artillery with the mobile groups is of decisive importance.

By the end of the first day of the battle, one of our mobile groups operating in the direction of main effort moved into a breach in the enemy defenses. One of the artillery regiments assigned to accompany the tanks was moving within the battle formation of the first echelon of the mobile group. The commander of the regiment was in constant communication with the artillery which supported the commitment of the mobile group into the breakthrough, and with the long-range artillery.

When our tanks reached the area of the second echelons of the enemy, they encountered a rather dense standing barrage which blocked their way. But because of the well organized communication with the long-range artillery, the enemy batteries were quickly suppressed.

Soon, however, the first echelons of our tanks were subjected to a flank counterattack by twenty enemy tanks which were supported by the antitank artillery of a strongpoint located on the other flank. It was evident that the enemy tanks were to be taken care of first. Accordingly, the right flank

group of our tanks, supported by a battery from the accompanying artillery, attacked the enemy tanks and, having partially destroyed them, forced them to withdraw to their line of departure. But the strongpoint had a fairly good antitank defense made up of thirty antitank guns of various calibers and a great number of antitank rifles.

So the accompanying artillery deployed in battle formation and half-ringed the strongpoint. As a result of an intense engagement, the strongpoint was suppressed. Success in this case was achieved through an efficient cooperation of the tanks with the accompanying artillery. The details of this cooperation had been worked out long before the beginning of the operation. The plan had specified how, in what sequence, and by what groups the strongpoints encountered on the way would be attacked. While the tanks, halting momentarily, fired at various fire nests along the route of their movement, the

accompanying batteries suppressed the antitank guns of the enemy, paying particular attention to the guns delivering flanking fires. By doing so they secured freedom of action for the tanks.

The above example shows that there are two variations of the employment of the accompanying artillery: deployment in the battle formation with some of the tanks for the suppression of strongpoints, and deployment for repelling the tank counterattacks of the enemy. In the first variation, the mission of the accompanying artillery amounts to the quick destruction of the antitank weapons impeding the tanks, or to the support of the combined infantry and tank attack. In the second variation, the accompanying artillery, using direct fire, destroys the counterattacking tanks and, with some of its batteries, knocks out enemy antitank weapons, thereby securing freedom of maneuver for the mobile group.

Under the Greenwood Tree

From "Notes from India" in *The Fighting Forces* (Great Britain) April 1944.

THE RAF has debunked the jungle. In a new edition of "Under the Greenwood Tree," a booklet dedicated by Air Command, India, "to the feet of the aircrews who may have to walk home" from Burma, a chapter-head, "This Jungle Bungle," says: "It is high time that the jungle was debunked. Hollywood has cashed in on the fact that few people have ever been in a genuine jungle. In consequence they can lay it on as they like—and they do. We would not mind finding ourselves alone in the jungle with Dorothy Lamour—but not in the Hollywood jungle. There the place is seething with treacherous natives, ghost tigers (the kind you can't kill), snakes, gigantic trees towering away dimly into the green darkness, exotic plants, monkeys swinging lightly from branch to branch, and the traveler desperately hacking his way through the densely matted underbrush while thorns tear at his tattered garments, sweat pours into his eyes, and poisonous insects

swarm in their thousands. It must have gone down well in the suburbs. In reality it is not like that at all. It is tall and dark and silent. There is densely matted undergrowth, through which progress is slow and difficult, and there are some leeches and mosquitoes, but you will be lucky if you see a snake, and the only heavy animals are rhino, which are so timid that few people ever see them."

Of elephants the book says: "While they cannot jump or tackle really steep slopes without sitting down, they sneer at all but the stoutest trees. And you can feel very foolish up a tree which is being pushed over from below."

The book describes jungle feeding, including both catching and cooking the meal, lists "the more important" Burmese phrases, such as "Government will give you a reward," and explains the symptoms and treatment of jungle ailments.

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